PRECLINICAL AND CLINICAL STUDY OF *VAATHA CHOORANAM* (INTERNAL MEDICINE) AND *VAATHA MEGA NAARAYANA ENNAI* (EXTERNAL MEDICINE) IN THE TREATMENT OF *VALI AZHAL KEEL VAAYU*(RHEUMATOID ARTHRITIS)

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DECLARATION BY THE CANDIDATE

I hereby declare that this dissertation entitled Preclinical And Clinical Study of Siddha Drug *"Vaatha Chooranam"* (Internal) And *"Vaatha Mega Narayana Ennai"* (External) In The Treatment of *"VazhiAzhal Keel Vaayu"* (Rheumatoid Arthritis) is a bonafide and genuine research work carried out by me under the guidance of **Dr.N.J.MuthuKumar, M.D(S), HOD** i/c**.,** Department of ***Sirappu Maruthuvam***, National Institute of Siddha, Chennai -47, and the dissertation has not formed the basis for the award of any Degree, Diploma, Fellowship or other similar title.

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BONAFIDE CERTIFICATE

Certified that I have gone through the dissertation submitted by **Dr.T.R.Nishitha, (Reg.No: 321413205)** a student of final year M.D(s), Branch-III, Department of ***Sirappu Maruthuvam***, **National Institute of Siddha**, Tambaram Sanatorium, Chennai-47, and the dissertation work has been carried out by the individual only. This dissertation does not represent or reproduce the dissertation submitted and approved earlier.

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INTRODUCTION

Siddha system of medicine is one of the ancient traditional system practiced in southern peninsula of India. This system reflects the cultural practices and medical wisdom of the civilians of the land. .Apart from treating the diseases the Siddha system contributes more on preventing many maladies.

Siddhars the originators of siddha medicine have taught us the virtues of a good practitioners and led a simple life above the narrow division of creed, religion, colour, and nation.The simplest way for a healthy living is to live according to the laws of nature as emphasized by Siddhars who lived longer without any senile change. These noble people have not only contributed a system of medicine but also to explains the way to attain the eternal bliss, it is essential to have a healthy body

Siddhars explained the body as a whole is made up of five elements Earth, water, fire, air and Ether which are the fundamentals of creation, protection, and destruction. The drugs for treating disease have been procured from the plants, animal, and mineral origin. Various type of medicinal preparations such as gruels, powders, decotions, medicated ghee, oil, thailam, paste etc, are given vively. Such prepared drugs have the properties and qualities pertaining to panchabhootham .

The human body is conditioned by three humors consisting of *Vaatham, pittham, Kabham*. These three vital forces *(Vaatham, Pitham, Kabam)* of cosmic elements are named under the action or reaction of the panchaboothams.[6] The deranging of this vital forces causes disease. Aim of this system of medicine is to balance the vital forces and setting right the equilibrium of the three energies

“மிகினும் குறையினும் நோய் செய்யும் நூலோர்
வளிமுதலா எண்ணிய மூன்று” **-திருவள்ளுவர்**

In the text book of *Siddha Maruthuvam Pothu, Vali Azhal Keel Vaayu* is described in *Sababathikaiyaedu* ,among 10 types of *Keel Vaayu , ValiAzhal Keel Vaaayu* is one of the type ,with symptoms of Indigesion , Sour Belching, Distention of stomach, Constipation, Redness ,Burning sensation, Pain, in wrist joint, ankle joint and phalanges, pricking pain, swelling, burning sensation over the joints, is compared

to symptoms of Rheumatoid Arthritis in modern science. Various siddha formulation has been mention in siddha literature to treat *Vali Azhal Keel Vaayu.*

Rheumatoid Arthritis (RA) is a most inflammatory disease of the joints, It is a systemic disease of the young and middle aged adults. Characterized by proliferation and destructive changes in synovial membrane, Periarticular structures, skeletal muscles and periarticular sheaths. Eventually joints are destroyed, fibrosed or ankylosed.

The prevalence of Rheumatoid Arthritis is ranges from 0.8% of the general population. Women are affected three times more often than men. Life risk of rheumatoid arthritis is estimated 4% among women and 3%among men. In India a local survey in Delhi shows the prevalence of this disease affecting 0.75% of population

Patients diagnosed with Rheumatoid Arthritis visiting Ayothidoss Pandithar Siddha hospital considerably increasing for the past few years. There are many treatment modalities available in modern system especially with Non steroidal anti-inflammatory (NSAID) drugs, steroids and cytotoxic drugs to treat *Vazhi Azhal Keel Vayu.* Due to more adverse effects of these drugs the patients were suffering more than cure. So, author decided to find a new formulation for this ailment.

I Investigator had selected *Vaatha chooranam* (Internal) and *Vaatha Mega Narayana Ennai* (External) for treating *Vali Azhal Keel Vaayu* (Rheumatoid Arthritis) Which is a polyherbal preparation to equalize the de-ranged *Vaatham, Pitham* and *Kabam.* The ingredient of the trial drug, *Smilax china, Terminalia cebula, Acorus calamus, Piper lon*gus possess Anti- inflammatory, Anti-oxidant property, Aanalgesic property. Hence this trial drug has been selectedfor the trail for treating *Vali Azhal Keel Vaayu* (Rheumatoid arthritis)

AIM

To evaluate the therapeutic efficacy of siddha drugs *"Vaatha Chooranam"* (Internal) and *"Vaatha Mega narayana Ennai"* (External) in the treatment of *"Vali Azhal Keel Vayu"* (Rheumatoid arthritis)

OBJECTIVE

PRIMARY OBJECTIVE

To evaluvate the therapeutic efficacy of siddha drugs *"Vaatha Chooranam"* (Internal) and *" Vaatha Mega narayana Ennai"* (External) in reducing the pain and restricted movement in the treatment of *"Vali Azhal Keel Vayu"* (Rheumatoid arthritis)

SECONDARY OBJECTIVES

- To study the siddha basic principles towards the efficacy of the medicine
- To evaluate the safety of the trial drugs by doing toxicology studies Acute and Long term study
- Biochemical analysis of the drug

VALI AZHAL KEEL VAAYU

Synonym: Uthiravaathasuronitham, Mudakkuvaatham

Siddha system of Medicine is an ancient one enriched with good resources. The sources of Siddha medicines include Herbs, Minerals, Metals and also animal origin..

Siddha system was propounded by the Siddhars is a vast and unique system which defines health as a perfect state of physical, psycho social, social and spiritual wellbeing of an individual.

The system not only deals with medicinal but with spirituality,righteous way of living, Rejuvenation and its main aim is attainment of perfection.

"அண்டத்திலுள்ளதே பிண்டம்
பிண்டத்திலுள்ளதே அண்டம்."

- சட்ட முனி ஞானம்.

The universe around as in the Macrocosm (Andam) and the human body is considered as the Microcosm (Pindam). Any changes in the Macrocosm will have its impact in the Microcosm in the human body.

"நிலந்தீ நீர்வளி விசும்போ டைந்தும்
கலந்த மயக்கம் உலகம் ஆதலின்
இருதிணை ஐம்பால் இயனெறி வழா அமைத்
திரிவில் சொல்லொடு தழாஅல் வேண்டும்."

-தொல்காப்பியம் பொருள் அகராதி.

The poet explains that both Andam and Pindam formed by the basic five elements called panchaboodhams. They are

1. Pirithivi (Earth)
2. Appu (Water)
3. Theyu (Fire)
4. Vaayu (Air)
5. Aahayam (Ether)

These five elements combined to form Three Thathus.

1. Vaatham
2. Pitham
3. Kabam

These three thathu composed of

1. Vatham = Air + Ether
2. Pitham = Fire
3. Kabam = Earth + water

The physiological units of the Human body is otherwise called as Vali (Vatham), Azhal (Pitham) and Iyyam (Kabam). They are also formed by the combination of the five basic elements. Accordingly Vali is formed by the combination of Vayu (Air) and Aagayam (Space). This is the ***Creative force***. Azhal is formed by theyu (Fire). This is the ***Force of Preservation***. Iyyam is formed by Prithivi (Earth) and Appu (Water). This is the ***Force of Protection***. These three humors are in the ratio of 4:2:1 in equilibrium which is a healthy normal condition and disturbance in their equilibrium leads to diseases. This is denoted in

"பொங்கிய தைந்துக்குள் பொல்லாதது இம் மூன்றுதான்
தங்கிய வாயு சமத்தன் மகாவாதம்
பங்கிய வன்னியால் பகுந்தது பித்தமே

பகுந்த சலத்தில் பரிசிக்கும் நல்லையும்

வகுந்த இம்மூன்றால் வளர்ந்தது நோயெல்லாம்
அகுந்தது தானறிந்து அளவிட்ட யோகிகள்
மகிழ்ந்தே யிதில் நின்ற மயக்கம் அறிவாறே."

-பதிணென் சித்தர் நாடி சாஸ்திரம்

These three thathus perceived as Naadi which is unique feature of Siddha system.When the above three humours are affected (or) not in a balanced state , they become Kuttram which predisposes to diseases.

I. Vali (Vaatham)

These active elements are always supported by the two stable elements, for change can only happen upon the foundation of stable. Thus Vayu and Aahaayam combine to become "**Vaathamhumor"** which controls all aspects of movements as well as space with in the body. In spite of this combination, however, Vaatham sends to primarily display the characteristics of Vayu-Air. The words"Dry, light, cold, quick, rough, minute and mobile" describes the characteristics of Vaatham.

II. Azhal (Pitham)

This is the function that governs all the body's conversion processes as well as its heat and energy producing capacities. Pitham is primarily characterized by the qualities of Theyu, which are "hot, sharp, penetrating, light, acidic, and slightly oily".

III. Iyyam (Kabam):

It controls liquefaction, lubrication and cohesion. It is also responsible for giving solidity and structure to the body. Kabam primarily reflects the qualities of the water, but also some traits of the earth elements, consequently, Kabam is heavy, slow, cold, steady, solid and oily.

ARTHRITIS – MOOTTU VAATHAM

Arthritis is a group of conditions involving damage to the joint of the body. There are over 100 different forms of arthritis. Excess of vaatham affects the joints all over the body and Vitiation of Kabam causes indigestion. Thus the end product of digestion associated with vaatham, pitham, kabam blocks the tissue pores and passages with waxy material. It also affects simultaneously the joints of the body such as knee, shoulder, hip, neck etc. This produces the stiffness of the joints. Hence it is also known as **Mudakkuvatham.**

VALI AZHAL KEEL VAAYU

Definition (Iyal)

Valiazhal keel vaayu is defined asincrease in vaatham and pithakutram, charecterised by pain in joints, swelling, tenderness, caused by various causes as mentioned below

AETIOLOGY :

1. **According to YugiVaithyaSinthamani,**

"என்னவே வாதந்தா னெண்ப தாகும்
மிகுத்திலே மனிதர்களுக் கெய்து மாறு
பின்னவே பொந்தனையே சோரஞ் செய்து
பெரியோர்கள் பிராமணரைத் தூஷ் ணித்தும்
வன்னவேவச்சொத்திற் சோரஞ் செய்து
மாதாபிதா குருவை மறந்த பேர்க்கும்
கன்னவே வேதத்தை நிந்தைசெய்த பேர்க்குங்
காயத்திற் கலந்திடுமே வாதந் தானே."

"தானென்ற கசப்போடு துவர்ப்பு ரைப்பு
சாதகமாய் மிஞ்சுகினுஞ் சமைத்த வன்னம்
ஆனென்ற வாறினது பொசித்த லாலும்
ஆகாத் தேறலது குடித்த லாலும்
பானென்ற பகலுறக்க மிராவி ழிப்பு
பட்டினியே மிகவுறுதல் பார மெய்தல்
தேனென்ற மொழியாற் மேற் சிந்தை யாகில்
சீக்கிரமாய் வாதமது செனிக்குந் தானே."
"ஆணான வரன்றனெளயே மதியா மாந்தர்
அகதிபர தேசியர்கட் கன்ன மீயார்
கோனான குரமொழியை மறந்த பேர்கள்
கொலைகளவு பொய்காமங் குறித்த பேர்க்கு
ஊனான சடந்தன்னில் வாதம் வந்து
உற்பவிக்கும் வேதத்தி லுண்மை தானே."

- **யூகி வைத்திய சிந்தாமணி**

According to the saint Yugi's text, those who are squandering money, insulting the elders, blaspheming the Holy books, not respecting the divine gifts, abandoning or forgetting the parents having wickedness in their mind and those with sleeping in the day time and awake up during night will get Vaatham diseases, hot taste, increased intake of water,excessive starvation, Increased intake of bitter and astringent taste, increased sexual indulgence desire will produce Vaatha diseases.

FACTORS THAT INFLUENCE THE VATHA TYPE OF DISEASES:

கால இயல்பு – Environmental Factors:

Relation between occurrence of Vaatha Diseases and Seasonal variations:

"ஆடியாதியாய் ஐப்பசி ஈறாய்
அனிலமதற் கோரரசியல் காலம்."

Vaatham elevates in the body from the month of Aadi to Iyppasi (July to September)i,e from the middle of Muthuvenilkaalam,Kaarkaalam to half of Koothirkaalam.

To summarise, Vaatha diseases occur due to certain diet capable of increasing vatham, certain habits and environmental changes which elevates vatham.

Diet

"தொழில்பெறு கைப்புக்கார்த்தல் துவர்த்தல் விஞ்சுகினுஞ்
சோரும் கழையதாம் வரகு மற்றைப்பைந்தினை யருந்தினாலும்
எழில் பெறப்பகலுறங்கி இரவினிலுறங் காததாலும்
மழை நிகர் குழலினாலே வாதங்கோ பிக்குங் காணே."

- பரராச சேகரம்

According to Pararasa sekeram, excess consumption of bitter taste, astringents and sour tastes, increased intake of old cooked rice, intake of grains, day time sleep and wake up at night time will get Vaatham diaeases.

CLINICAL FEATURES OF UTHIRAVATHA SURONITHAM:

“வைகிதமாய்க் கணைக்காலு முழங்கால் தானும்
மற்கடக் சந்துபுறவடியும்வீங்கிச்
செய்கித மாற் சிறுவிரல்கள் மிகவும் நொந்து
சிந்தை தடுமாறியே சலிப்புண்டாகும்
பைகிதமாம் பயித்தியத் தில்லாத மிஞ்சிப்
பாரமாய் உற்பவித்து அழலுண்டாகும்
உய்கிதமாம் அசனமது தானும் வேண்டா
உதிர வாத சுரோணிதத்தி னுணர்ச்சியாமே.”

-யூகி வைத்திய சிந்தாமணி

It is characterised by pain and swelling in both ankle joints, knee joints and all smaller joints of the hands, feeling of tiredness, fever, loss of appetite and mental depression.

Also the term ‘Markadam’ (**மற்கடம்**) indicates the hand of monkey (T.V.SampasivamPillai dictionary Pg no: 753) anatomically which can be correlated clinically with Swan neck deformity and wasting of thenar muscle in Rheumatoid Arthritis.

2. THE CLINICAL FEATURES OF UTHIRAVATHA SURONITHAM IN ‘PARA RASA SEKARAM’:

“பக்கமும் மார்பும் கூடப்பற்றியே இழுத்துக் கொண்டு
நெக்கியே மார்பிளைத்து தோதாய் நரம்பிழுத்து
ஒக்கவே சயித்தியங்கள் உயர்ந்துடன் மேலும் காலம்
மிக்குமே உதிரவாதம் என்றிதுவிளம்பலாமே.”

- பரராச சேகரம்

It is characterised by pain and tenderness of the axilla, breathlessness, pain in the upper limbs and the lower limbs.

நோய்க்கணிப்பு (DIAGNOSIS)

"நோய்நாடி நோய்முத னாடி யதுதணிக்கும்
வாய்நாடி வாய்ப்பச் செயல்."

-திருக்குறள்.

This Thirukural quote explains the importance of diagnosis as it is to be made in order of the aetiology, root of cause of the disease thereby treating the disease with appropriate medicine.

Piniyarimuraigal (Method of Diagnosis)

Piniyarimuraigal (Method of Diagnosis) is based upon the three main principles:

- PoriyalArithal (Inspection)
- PulanalArithal (Palpation)
- Vinaathal (Interrogation)

Poriyalarithal (Inspection):

"Poriyalarithal" means examining the "Pori" of the patient by the physician for proper diagnosis.

Pori -five sense organs.

They are as follows,

- Nose
- Tongue
- Eye
- Skin
- Ear.

2. **Pulanalarithal (Palpation):**

"Pulanalarithal" means examining the "Pulan" of the patient by the physician to diagnosis a disease.

Pulan- senses

They are,

- Smell
- Taste
- Vision
- Sensation of touch
- Hearing

3. Vinaathal (Interrogation):

Vinaathal is gathering of information about the history of the disease, its clinical features etc., from the patient or his close relatives who are taking care of them. Vinaathal is helpful when the patient is not in a position to speak or when the patient is child.

Types of Naadi (Pulse) felt in Valiazhal keel vaayu:

In Siddha system of Medicine "Naadi diagnosis (Pulse reading)" is the first and foremost diagnostic parameter.

In Valiazhal keel vaayu the following types of Naadi can be commonly seen. They are,

- Vaatha pitham
- Vaatha kabam
- Pitha vaatham
- Kaba vaatham

DIFFERENTIAL DIAGNOSIS

Valiazhal keel vaayu is differentiated from other types of Vatha Suronitham as follows:

S.NO	DISEASES	SIGNS AND SYMPTOMS
1.	Vaatha Suronitham	▪ Emaciation. ▪ Swelling of joints. ▪ Restricted movements. ▪ Joint pain. ▪ Discomfort. ▪ Excessive salivation. ▪ Loss of appetite.

2.	Sithuvatha Suronitham	▪ Anasarca. ▪ Wrinkles. ▪ Neural pain. ▪ Glossy tongue. ▪ Sialorrhoea. ▪ Bullous eruption as in burn. ▪ Exfoliation, swelling and Warmthness.
3.	Vaikitha Vaatha Suronitham	▪ Swelling with hyperaemia. ▪ Soft on touch. ▪ Cough with pyrexia. ▪ Irritability.
4.	Paithiya Vaatha Suronitham	▪ Hyperaemia. ▪ Tenderness in knee, elbow and smaller joints. ▪ Poly arthralgia. ▪ Pyrexia. ▪ Anaemia.
5.	Slethuma vaatha Suronitham	▪ Chillness with abdominal distension. ▪ Severe pain and Head ache. ▪ Syncope and Hallucination. ▪ Dryness of mouth and Anorexia. ▪ Tachycardia.
6.	Utharavaatha Suronitham	▪ Fever with rigor. ▪ Dryness of mouth. ▪ Pain in all over the joints. ▪ Headache. ▪ Diarrhoea. ▪ Excessive thirst. ▪ Hunger.

LINE OF TREATMENT

In Siddha system, the treatment is based upon the Mukkutram principle. Treatment is not only for perfect healing but also for the Prevention of disease progression and Rejuvenation of Udalkattugal.

While treating a disease, it is essential to know the etiology, the nature of the patient, severity of the illness, the seasons and the time of occurrence.

Line of treatment is as follows:

Kappu (Prevention)

Neekkam (Treatment)

Niraivu (Restoration)

I.KAAPPU (PREVENTION):

"Prevention is better than cure" is a proverb. Knowing the cause there by removing it and thus preventing the disease is the main aim of Siddha system of medicine.

Siddha system emphasizes the purification of thought and activities in the underlyinglines quoted from the text **"Theraiyar Pinianuga Vithi"** which emphasizes virtueness to be followed even in the daily life activities. i.e.,

பாலுண்போம் எண்ணெய்பெறின் வெந்நீர் குளிப்போம்
பகற்புணரோம்; பகற்றுயில்வோம்: பாயோதரமு மூத்த
ஏலஞ்சேர் குழலியரோடி ளவெயிலும் விரும்போம்;
இரண்டடக்கோம்; ஒன்ரைவிடோம்; இடதுகையிற் படுப்போம்;

2.NEEKAM (TREATMENT IN SIDDHA):

The aim of treatment is based on,

a) To bring the Three Thodams to normal equilibrium state.

b) To treat the patient by Internal and external medicines.

c) To stabilize 7 Udalthadhukal and 3 Uyirthadhukal.

To bring the three Thodams to normal equilibrium state first by giving purgation.

Diet Restrictions (Pathiyam):

During the course of treatment, the patients were advised to follow certain dietary regimen (Ichapathiyam) which is mentioned for vaatha diseases.

1. Kadugu
2. Ell Nei

3. Kalyana Poosanikkai
4. Kadalai
5. Thengai
6. Mangai
7. Poondu
8. Pala
9. Kollu
10. Pugaiyilai
11. Pagal
12. Agathi
13. Sour taste
14. Astringent taste

3. NIRAIVU (RESTORATION):

Reassurance from disease recovery was given to all patients by promoting the awareness about the dietary, seasonal, emotional influence on the disease. Life-style modification was also advised to them.

YOGAM FOR UTHIRAVATHA SURONITHAM:

The patients are advised to do the following Yogasanas regularly.

- Poorna santhi asanam
- Mathriga pranayamam

In case of sleep disturbances and depression:

Nithirai pranayamam and Dhiyanam.

MODERN ASPECT

RHEUMATOID ARTHRITIS

INTRODUCTION

Rheumatoid arthritis (RA) is chronic multi system disease of unknown etiology that primarily targets synovial joint and hence an important cause of potentially preventable disability. Although there are a variety of systemic manifestations the characteristic feature of(RA) is persistent inflammatory synovitis, usually involving pheripheral joints in a symmetric distribution. The potential of the synovial inflammation to cause cartilage damage, bone erosion and subsequent changes in joint integrity is the hallmark of the disease

Epidemiology and genetics

The prevalence of RA is approximately 0.8% of the population (range 0.3to 2.1%), for reasons that are still unclear the prevalence in women is two or three times greater than in men. The onset is most frequent during the fourth and fifth decades of life with 80% of all patients developing the disease between the age of 35 and 50.the incidence of (RA) is more than six times greater in 60-64 old yr old women compared to 18-29 year old women. Since the incidence of (RA) is stable with age RA is a lifelong disease.

Genetic clearly play a significant role in determining both the risk of developing ra and the severity of the disease. The association of certain human leukocyte antigen (HLA) alleles, specifically HLA-DR4, and an increasing risk of developing ra has been long been recognized[5].

Pathogenesis

RA appears to require the complex interaction of genetic and environmental factors with the immune system and ultimately the synovial tissues throughout the body.

Microvascular injury and an increased in the number of synovial lining cells appear to be the earliest lesion in the RA. An increased number of synovial lining cells is seen along with perivascular infiltration with mononuclear cells, before the onset of clinical symptoms the perivascular infiltration is predominantly composed of myeloid cells, whereas in symptomatic

arthritis, T cells can also be found. As the process continues the synovium become oedematous, protrudes, in to joint cavity as villous projection.

The endothelial cells of the rheumatoid synovium have the appearance of high endothelial venules of lymphoid organs and have been altered by cytokines exposure to facilitate entry of cells in to tissue. The mononuclear cell collections are variable in composition and size. The pre- dominant infiltration cell is the T LYMOPCYTE CD4+ T CELLS predominate over CD8+ TCELLS and frequently found in close proximity to HLA-DR+ macrophage and dendritic cells. The major population ofT cells in the rheumatoid synovium is composed of CD4+memory cells that form the majority of the cells aggregated around postcapillary venules.CD8+ cells are scattered throughout the tissues. Besides infiltration of T cells there is infiltration of B cells and antibody producing plasma cells.

In advanced disease, structures similar to germinal centres of secondary lymphoid organs may be observed in the synovium.

Both polyclonal immunoglobulin and autoantibody rheumatoid factor are produced within the synovial tissue, high leads to the local formation of rheumatoid synovium. Increased number of activated mast cells are found in the rheumatoid synovium, local release of the content and presence of antibodies leads to inflammation**.**

The synovia fibroblast in the RA manifest evidence of activation of fibroblast in RA manifest evidence of activation and produce a number of enzymes such as collagenase and cathepsins that can degrade components of the articular matrix, this fibroblast are found prominently in the lining layer and at the interface in the bone and cartilage. Osteoclast are found at the site of bone erosion.

The rheumatoid synovium is characterized by the presence of secreted products of activated lymphocytes, macrophages and fibroblast. The local production of these cytokines and chemokines appears to account for many of the pathological and clinical manifestation in RA including synovial inflammation, synovial fluid inflammation synovial proliferation, and cartilage and bone damage as well as systemic manifestation of RA

CLINICAL MANIFESTATIONS

- Pain ,Swelling, Tenderness
- Morning Stiffness more than one hour

OTHER CONSTITUTIONAL SYMPTOMS

- Weakness
- Fatigability
- Anorexia
- Weight loss

AURTICULAR-MANIFESTATION

DEFORMITY	PATHOLOGY	CAUSE
Spindling of fingers	Swelling of proximal interphalangeal joints	Due to thickened synovial membrane leads to cartilage erosion causing spindling
Swan neck deformity	Hyperextension of the proximal interphalangeal joint and flexion of the distal inter phalangeal joint	Due to rupture of volar plate of PIP joints, which enablethe tendon to slip towards the dorsal side. This is known as Intrinsic pulse deformity
Boutonniere or Button hole deformity	Flexion of proximal interphalangeal joints and extension of the distal interphalangeal joint	rupture e of central extensor expansion of the fingers resulting in flexion of PIP joint
Drooped finger	Patial or complete loss of voluntary extension, hyper extension of the middle jointin an effort to extend the distal phalanges	Extensor tendon rheumatoid granulomata and tendon rupture

DEFORMITY	PATHOLOGY	CAUSES
Trigger finger or tenosynovitis	Locking of the finger in a position of flexion.	The sheath of a flexor tendon thickens, apparently spontaneously to entrap the tendon
Ulnar deviation	Swelling of the meta carpo phalangeal joints, the big knuckles at the base of the fingers causes the fingers to become displaced, tending towards the little finger.	Rupture of the collateral ligament at meta carpo phalangeal joints which enables extensor tendon to slip from their grooves towards the ulnar side

FOOT DEFORMITIES:

Callosity under PIP joint
Plantar callosity
Atrophy of plantar metatarsal fat pad
Prominent metatarsal head
Claw toes
Hammer toes
Rheumatoid nodules
Achilles tendinitis
Flattening of longitudinal arch
Hallux valgus
Overriding of second and third toes

EXTRA-ARTICULAR MANIFESTATION

Rheumatoid nodules	They are round masses felt in sub cutaneous tissue mainly in Olecranon bursa, the proximal ulna, the Achilles tendon.etc
Rheumatoid vasculitis	Polyneuropathy and mononeuritis multiplex, cutaneous ulceration, palpable purpurae
Pleuro pulmonary manifestation	Pleural effusion, Interstitial fibrosis, Pneumoconiosis
Cardiovascular manifestation	Pericarditis, Pre-mature atherosclerosis, valvular involvement, conduction defects
Neurological manifestation	Capal and tarsal tunnel syndrome, Spinal Compression , Peripheral neuropathies

DIAGNOSIS

Diagnosis of RA should be consider in patients with bilateral symmetrical, inflammatory polyarthritis involving small and large joints with sparing of the axial skeleton except the cervical spine

CRITERIA FOR DIAGNOSIS EULAR

A. JOINT INVOLVEMENT

One large joint

2-10 large joints

1-3 small joints

4-10 small joints

>10 joints

B. Serology

Negative RF and negative anti-citrulinated protein antibodies

Low –positive RF for low ACPA

High-positive RF for high positive ACPA

Acute-phase reactants

Normal CRP and normal ESR

Abnormal CRP or abnormal ESR

Duration of symptoms

<6weeks

≤ weeks

INVESTIGATION

Markers of acute –inflammation-raised ESR, anaemia, thrombocytosis, increased level of acute phase protein, C-reactive protein and increased plasma viscosity

Rheumatoid factor

Anti-cyclic citrulinated protein antibodies

Radiographs of the affected joint

Ultrasonography and MRI

Synovial fluid analysis, synovial biopsy arthroscopy

RHEUMATOID FACTOR (RFs)

Rheumatoid factor are IgM and IgG autoantibodies against the Fc portion of IgG . RF is present in about 80% of patient with RA it can also be found in number of other disease. RF testing is appropriate in patient suspected of having RA. RF is a good screening tool. In patient with RA, RF titre generally correlates with extra-articular manifestation and disease severity. However RF titre is not useful in following disease progression. Hence, if a patient is RF positive there is no need to repeat it later.

MANAGEMENT

Rest and splinting of the joints should be instituted in acute stage of illness

Active and passive physiotherapy helps in mobilization and prevention of contracture

Analgesics Medicines

Modifying Anti-rheumatic drugs

PROPERTIES OF TRIAL DRUG

INTERNAL DRUG : VAATHA CHOORANAM

PARANGI PATTAI

Botanical name : *smilax china*

Family : Smilaceae

Parts used : Rhizome

Organoleptic characters

Taste : Sweet

Potency : Cold

Division : Sweet

Action : Anti-inflammatory, Anti cancer, Anticoagulation

General characters

தாகம் பலவாதய் தாது புண்பிளவை
மேகங் கடிகிரந்தி வீழ்மூலந்-தேகமுடன்
குட்டை பகந்தமேற் கொள்வமனம் போம்பற
பங்கியினை யுச்சரீத்துப் பார்

- அகத்தியர் குனவாகடம்

Medicinal uses: It is indicated for treating veneral disease, rheumatism, Chronic skin infection

ATHIMATHURAM

Botanical name : *Glycyrrhiza glabra*

Family : Fabaceae

Parts used : Root

Organoleptic characters

Taste : Sweet, Bitter

Potency : Cold

Division : Acrid

Activity : Glycyrrhizin, Glycerrhizin

General character

கைத்தியரி முப்பி!ணியால் வருபுண் தாகைங்
கண்ணோய் உன் மாதம்விக்கல் வலிவெண் குட்டம்
பித்தமெலும் புருக்கி கிரிச்சரம் ஆவர்த்த
பித்தமத மூர்ச்சை விட பாகம் வெப்பந்தணிக்கும்

அகத்தியர் குனவாகடம்

Medicinal Uses:

This drug is useful in treating gastric and duodenal ulcer asthma, hypertension, rheumatoid arthritis and dermatitis

KADUKKAI

Botanical name : *Terminalia chebulla*

Family : Combretaceae

Parts used : Fruit

Organoleptic characters

Taste : Sweet, Astringent, Sour, Bitter, Pungent

Potency : Cold

Division : Acrid

Action : Laxative, Hypolipidaemic, Antioxidant, Hepato Protective, Adaptogenic and Cardiac activates are present in this drug.

General character:

தாடை கழுத்தக்கி தாலு குறியிவிடப்
பீடை சிலிபதமுற் போதிமுடம் ஆடைய்யெட்டாத்
தூலமிடி புண்வாத சோணிகா மாலையிரண்
டாலமிடி போம்வரிக்கா யால்

அகத்தியர் குனவாகடம்

Medicinal uses:

It is used in treating inflammation of mucous membrane of mouth and scalds, muscular rheumatism ,jaundice, abdominal distention, etc.Aqueous extract showed antioxidant and radio protector properties

NELLIKAI

Botanical name : *Phyllanthus emblica*

Family : Euphorbiaceae

Parts used : Fruit

Organoleptic characters

Taste : Sour, Astringent, Sweet

Potency : Cold

Division : Sweet

Action : Refrigerant, Diuretic, Laxative

Medicinal uses : It has antioxident with free radical scavenging properties, Hepatoprotective, Antimutagenic, anti microbial activities.

General charecter;

ஆகவன லஞ்சி சிர்க்கென்புருக் கிண்ணோய்
தாக முதிரவவித்தந் தாது நட்டம்- மேகனத்தின்
இல்லிமுள்ளி போலருகைல் அண்கா மியவியைங்கம்
நெல்லிமுள்ளி யாற்போ நினை

தேரையர் குணவாகடம்

THANDRIKAI

Botanical name : *Terminalia bellirica*

Family : Combretaceae

Parts used : Fruit

Organoleptic characters

Taste **:** Astringent

Potency **:** Hot

Division **:** Sweet

Action **:** Astringent**,** Expectorant, Laxative, Tonic .

General character

சிலந்திவிடம் கமியப்புண் சீழான மேகங்
கலந்துவரும் வாதபபித்தங் காலோ- டலைர்ந்துடலில்
ஊன்றிக்காய் வெப்ப முதிரபித் துங்கரக்குந்
தான்றிக்காய் கையிலெடுத் தால்

அகத்தியர் குனவாகடம்

Medicinal uses: Bile-stimulant activity, Anti-micribial activity, Hepatoprotective, hypolipidemic activity, It is useful in treating stomach disorders, dropsy, leprosy

POOLAN KIZHANGU

Botanical name **:** *Kaemifera galanga*

Family **:** Zingiberaceae

Parts used **:** Fruit

Organoleptic characters

Taste **:** Sweet, Sour, Astringent

Potency **:** Cold

Division **:** Sweet

Action **:** Refrigerant, Diuretic, Laxative carminative, stimulant

General characters:

ஓட்டும் நற் கிச்சிலியி ணொண்கிழங்குங் கபமும்
பூட்டுமுடமும்புண்ணும் போம்”

அகத்தியர் குனவாகடம்

Medicinal uses : Hypolipidaemic, wound healing, hepatoprotective, antibacterial, Anti-fungal

KIRAMBU

Botanical name : *Syzygium aromaticum*

Family : Mytraceae

Parts used : dried bud

Organoleptic characters

Taste : **Pungent**

Potency : **Hot**

Division : **Pungent**

Actions : Antispasmodic, Carminative ,Stomachic

General charecters

பித்தமயக்கம் பேதியோடு வாந்தியும்போம்
சுத்தவிரத் தக்கடுப்புந் தோன்றுமோ மெத்த
இலவங்கங் கொண்டவருக் கேற் சுகமாகும்
மலமங்கே கட்டுமெனவாழ்த்து.

அகத்தியர் குணவாகடம்

DHEVATHARAM

Botanical name : *Cedrus deodra*

Family : Pinaceae

Parts used : wood

Organoleptic characters:

Taste : astringent

Potency : Hot

Division : Pungent

Action : Anti-inflammatory activity.

General Charecter

தேவதா ரக்குணந்துவளர் பீனிசத்தைக்
காவகத்தி லோட்டுங் கரப்பலவே-மாவலவர்
சொல்லும்பு ராண சுரமொடு நீரேற்றத்தை
வெல்லு மனற்றணிக்கு மெய்

அகத்தியர் குனவாகடம்

Medicinal uses: Used in the treatment of rheumatoid arthritis

ATHIVIDAYAM

Botanical name : *Aconitum heterophyllam*

Family : Ranunculaceae

Parts used : root

Organoleptic characters

Taste : Bitter

Potency : Hot

Division : Pungent

General character

அதிவிடயம்சர்க்க ராற்புதநோய் வெப்பு
கொதிமருவு பேதியொடு கோழை-எதிர்வாந்தி
என்றுரைக்கும் நோய்கூட்டம் இல்லா தகற்றிவிடும்
குன்றை நிகர்முலையாய் கூறு.

அகத்தியர் குனவாகடம்

Action : Anti-inflammatory and analgesic.

Phyto chemicals : alkaloid, aconitine, alkaloidatisine, hetratisin, hetisine, and heterophylline.

Medicinal uses : Aconitine is used externally in neurolgia, rheumatism .

CHUKKU

Botanical name : *Zingiber officinale*

Family : zingiberaceare

Useful part : Rizome

Organoleptic characters

Taste : **Pungent**

Potency : **Hot**

Division : **Pungent**

Action : Anti ulcer**,** Antifungal, Anti –oxidant activity

Phytochemicals : Gingerol

General charecters:

சூலைமந்தம் நெஞ்செரிப்பு தோடமேப் பம்மழலை
மூலம் இரைப்பிருமல் மூக்குநீர்-வாலகப
தோடமதி சாரந் தொடர்வாத குன்மநீர்த்
தோடம்ஆ மம்போக்குஞ்சுக்கு.

Medicinal uses: It is used to treat dyspepsia, throat complaint , chronic rheumatism, gastro intestinal and respiratory disease.

THIPPILI

Botanical Name : Piper longum

Synonym : Charicaroxburgii

Family : Piperacae

Organoleptic Character

Taste : pungent

Potency : Hot

Division : Pungent

General charecter

“கட்டி யெதிர்நின்று கடுநோயெல் லாம்பணியும்
திட்டி வினையகலும் தேகமெத்த- புட்டியாம்
மாமனுக்கு மாமனென மற்றவர்க்கு மற்றவனாங்
காமமெனுந் திப்பிலிக்கும் கை – தேரன் வெண்பா

Phyto chemicals:

Piperine (4– 5%), Volatile Oil, Piperlonguminine, Piplartine, Sesamin, Terpenoids, Resin, Piperundecalidine.

Actions:

- Stimulant
- Carminative
- Alterative

Medicinal uses : It used in treating cough, bronchialasthma, muscularpain, rheumatism, neurological disease

MILAGU

Botanical Name	**:**	Piper nigrum
English Name	**:**	Black pepper
Family	**:**	Piperaceae
Organoleptic Character		
Taste	**:**	Bitter, pungent
Potency	**:**	Hot
Division	**:**	Pungent

பொது குணம்:

“தீயாகி யெங்கும் திரியுமதை யாவத்து
மோயாம லெப்படியு முண்டாக்காற்- பாயாது
போந்திமிர்வா தங்கிரந்தி புண்ணீரும் மண்ணவர்க்கும்
காந்திமெய்வா தச்சலுப்பைக் காய்

Actions:

- Carminative
- Pungent
- Antiperiodic
- Analgesic
- Anti- inflammatory
- Antioxidant
- Cyclo oxygenase inhibitory activity

EXTERNAL DRUG : VAATHA MEGA NARAYANA ENNAI

VAAIVIDANGAM

Botanical Name : *Emblicaribes*

English Name : Embelia

Family : primulaceae

Organoleptic Character

Taste : Bitter

Potency : Hot

Division : Pungent

General charecters

பாண்டுகுட்டம் குன்மம்பருந்தூல நோய்வாதந்
தீண்டு திரிவிடஞ் சிரந்துண்டம் -பூண்டமடி
நோய்விளங்கக் காட்டாத நுண்கிருமி யாசனப்புண்
வாய்விளங்கங்காட்டவிருமார்.

Actions:

- Carminative
- Antheilmintic
- Stimulant.
- Stomachic.

VELLULI

Botanical Name : *Alluim sativum*

English Name : Garlic

Family : Amaryllidaceae

Organoleptic Character

Taste : Pungent

Potency : Hot

Division : Pungent

பொது குணம்:

சன்னியோடு வாதந் தலைநோவு தாள்
மன்னிவரு நீர்க்கோவை வன்சீதம் அன்னமே
உள்ளுள்ளி கண்பாய்வன்சீதம்
வெள்ளுள்ளி தன்னால் வெருண்டு.

Actions:

- Carminative
- Tonic
- Alterative
- Stimulant
- Expectorant
- Diuretic
- Anthelmintic.

KODIVELI

Botanical Name : *Plumbago indica*

Family : Plumbaginaceae

Used part : Root

Organoleptic Character

Taste : Pungent

Potency : Hot

Division : Pungent

பொதுகுணம்:

கட்டிவிரணங்கிரந்தி கால்கள் அரையாப்புக்
கட்டிச்சூ லைவீக்கங் காழ்மூலம்-முட்டிரத்தக்
கட்டிநீ ரேற்றங் கனத்த பெருவயிறும்
அட்டுங் கொடிவேலி யாம்

Action:

- Tonic
- Stomachic
- Caustic
- Anti-pyeritic

SATHA KUPPAI

Botanical name : *Anethum graveolens.*

English name : The dill, Gardendill, Anet.

Family : Umblliferae

Organoleptic Character

Taste : Sweet, Pungent

Potency : Hot

Division : Pungent

Used parts : leaves, flower, seeds.

பொதுகுணம்:

வாதமோடு சூதிகா வாதம் சிரசுநோய்
மோதுசெவி நோய்கபநோய் மூடுசுரம்-ஓதுகின்ற
மூலக் கடுப்பு முதிர்பினசம் போகும்
ஞாலச் சதக்குப்பை நா...

COCONUT OIL

Botanical name : *Cocus nucifera*

English name : Coconut palm.

Family **:** Arecaceae

Organoleptic Character

Taste **:** Astringent

Potency **:** Cold

Division **:** Pungent

Action:

- Nutritive.
- Refrigerant
- Diuretic
- Demulcent.

பொதுகுணம்:

தேங்காயி நெய்யதனாற் றீயால்வருபுண்போம்
பாங்காகக் கூந்தற் படர்ந்தேறு நீங்காத
பல்லடியின் னோயும் படர்தா மரைசிரங்கும்
அல்லலறப் போமென் றறி

ELL ENNAI

Botanical name **:** *Sesame indicum*

English name **:** Gingelly oil.

Family **:** Pedaliaceae

Used parts **:** Seed

Organoleptic Character

Taste **:** Sweet

Potency **:** Hot

Division **:** Sweet

பொதுகுணம்:

புத்திநய நக்குளிர்ச்சி பூரிப்பு மெய்ப்புளகஞ்
சத்துவங் காந்தி தனியிள்மை மெத்தவுண்டாங்
கண்ணோய் செவிநோய் கபாளஅழல் காசநோய்
புண்ணோய்போ மெண்ணெய்யாற் போற்று

Action:

- Emmenagogue
- Stimulant
- Tonic
- Diuretic
- Galactogogue.
- Laxative.

VEPPA ENNAI

Botanical name **:** *Azadiracta indica*

English name **:** Neem oil

Family **:** Meliaceae.

Organoleptic Character

Taste **:** Bitter

Potency **:** Hot

Division **:** Pungent

Used parts **:** Seeds

Action:

- Anthelmintic.

AMANAKKU ENNAI

Botanical name **:** *Ricinus communis*

English name **:** Castor oil

Family **:** Euphorbiaceae.

Organoleptic Character

Taste **:** Bitter

Potency **:** Hot

Division **:** Pungent

Used parts **:** Seed

Action:

- Emollient.
- Laxative.

பொதுகுணம்:

ஆமணக்கு நெய்யா லனலமுண்டா மியாவர்க்கும்
கொள்ளில்வயிறுவிடுங் கோரமுள்ளவாயுவறும்
உள்ளில்வரு குன்மம்போ மோது.....

PUNGU ENNAI

Botanical name **:** *Pongamia pinnata*

Family **:** Fabaceae

Organoleptic Character

Taste **:** Bitter, Astringent

Potency **:** Hot

Division **:** Pungent

Used parts **:** Seed

பொதுகுணம்:

அங்க மழகிடும்வெற்பாம்புங்கி நெய்னக்குத்
தங்கம்போற் காந்தியது தானுண்டாந் திங்கண்முக
மானே விலகுமெனச்....

Action:

- Antiseptic.
- Stimulant

OMAM

Botanical name **:** *Carumc opticum*

Family **:** Solanaceae

Used part **:** Seeds

Organoleptic characters:

Taste **:** Pungent

Potency : Hot

Division : Pungent

General properties:

"சீதசுரங் காசஞ் செரியாமந் தம்பொருமல்
பேதியிரைச் சல்கடுப்பு பேராமம்- ஓதிருமல்
பல்லொடுபல்மூலம் பகமிவைநோ யென்செயுமோ?
சொல்லொடு போம் ஓமமெனச் சொல்."

- (அகத்தியர் குணவாகடம்)

Chemical Constituents:

The chemical composition of essential oil obtained from dry dry fruits of carum. Thymol (35-60), a-pinene, p-cymene, limonene and a-terpinene have been found. Camphene, carvacrol, dipentene, myrcne, phenols, terpinene, thymine, thymol, linoleic acid.

Actions:

Carminative, Stimulant, Stomachic, Anti spasmodic, Tonic, Antimicrobial, Diuretic, Antispasmodic.

Uses:

A paste of the crushed fruit is applied externally for relieving pains.

PERUNGAYAM

Botanical name : *Ferula asafoetida*

Family : Umbelliferaceae

Used parts : Gum-Resins

Organoleptic characters

Taste : Pungent

Potency : Hot

Division : Pungent

General properties:

"தந்தவே தந்த மூலத்தெழும்பிணி
சருவகாள்ம்விருச்சிகங்கீடம்மா
மந்தம்வாதம் உதாவர்த்தம் அல்குல்நோய்
மார்பணங்கட்ட குன்மம்மகோதரம்"

- (தேரையர் குணவாகடம்)

It is used for Gum diseases, snake poisons, scorpion poisons, vaatha diseases, ulcer, ascities.

Chemical constituents:

Organic sulphur compound, volatile oil containing essential oil of glic- allyl, allylpersulphide and two terpenes, ferulic acid, ester of ssaresino- tannol, alsomail, acetic, formic and valerainic acids.

Actions:

Stimulant, Carminative, Anti spasmodic, Anthelmintic, Emmengagogue, Expectorant, Nervine tonic.

VASAMBU

Botanical name **:** *Acoruscalamus*

Family **:** Arecacea

Useful parts **:** Rhizome

Organoleptic characters

Taste **:** Pungent

Potency **:** Hot

Division **:** Pungent

Actions:

Anodyne, Aphrodisiac, Aromaic, Febrifuge, sedative, Stimulant.

General properties:

"பாம்பதி நஞ்சற் புதப்புண் வலிவிடபாகங் குன்மம்
சும்பா ரிரத்தபித் தம்முக நாற்றம்வன்சூலைசன்னி
வீம்பாம்பை காசம் பிலீகஞ் சிலிபதம் வீறிருமல்
தாம்பாங் கிருமி யிவையேகு மாசிவ சம்பினையே.

- (தேரையர் குணவாகடம்)

Chemical constituents:

Asarone, Calamenol, Calamene, Eugenol, Methyl, Eufenol, Pinene, Camphene, Calamol, Azulene.

Action:

Stimulant, Stomachic, Antiperiodic Carminative, Nauseant, Emetic, Disinfectant, Germicide, Spasmolytic, Hypothermic, Anticonvulsant

Uses:

Plant causes sedative effect. It also reduces pain (Analgesic effect)

Phytochemicals:

Glucosideacorin renders the aromatic. Acorenone, isoshyobunine, b-asarone, calamendiol, -selinene, a-calacorene, calamuseneone, camphone and shyobunone are the constituents of the essential oil of sweet flag.

Paal (Milk)

பாலர் கிழவர் பழஞ்சுரத்தோர் புண்ணாளி
சூலயார் மேகத்தோர் துற்பலத்தோர் ஏலுமிவர்
எல்லார்க்கு மாகு மிளைத்தவர்க்குஞ் சாதகமாம்
நல்லாய்பசுவின்பால் நாட்டு.

Properties of Milk

Cow's milk is useful to children, adults, persons with chronic fever and having sores, arthritic complaints, syphilis and weaklings.

Kaadi(viniger)

பித்த மயக்கமறும் பேரவிஷ தம்முறியும்
உற்றபிணி யிற்சிலவை யோடுங்காண் சற்றும்
வழங்கா வசீரண்மும்வன்பேதி யும்போம்
பழங்காடிக்குள்ளபயன்

Properties of vinegar

Vineger cures giddiness due to bilious affections. It nullifies the effect of medicine and cures anorexia and diarrhoea

INTERNAL MEDICINE: VAATHA CHOORANAM

ATHIMATHURAM

NELLI

PARANGIPATTAI

KADUKKAI

DHEVATHARU

CHUKKU

THIPPILI

THANDRI

MILAGU

KIRAMBUS

POOLANGILANGU

ATHIVIDAYAM

EXTERNAL MEDICINE: VATHA MEGA NARAYANA ENNAI

KODIVELI

MILAGU

VASAMBU

VAIVIDANGAM

PERUNGAYAM

OOMAM

VELLULI

CHUKKU

THIPPILI

KIRAMBU

SATHAKUPPAI

KADUGAROHINI

KAADI

NALLENAI

VEPPAENNAI

VILAKKENAI

MILK

MATERIALS AND METHODS

STANDARD OPERATING PROCEDURE:

Source of raw drugs:

The required raw drugs for preparation of "*VATHA CHOORANAM"*(Internal) and *"VAATHA MEGA NARAYANA ENNAI*" (External) will be purchased from a well reputed country shop. These raw drugs will be authenticated by the competent Authority of Medicinal Botany, Then the medicines are purified and prepared in Gunapaadam Laboratory of National Institute of Siddha.

INTERNAL MEDICINE: *VAATHA CHOORANAM*

Ingredients:

Parangipattai[Rootof*Smilax china*]	-	l6 kalanju (80g)
Athimathuram[Root of *Glycyrrhizaglabra*]	-	10 kalanju (50g)
Kadukkai [Fruit of *Terminalia chebulla*]	-	4 kalanju (20g)
Nellikai [Fruit of *Phyllanthus emblica*]	-	4 kalanju (20g)
Thandrikai [Fruit*Terminalia bellirica*]	-	4 kalanju (20g)
Poolangilangu [Tuber of *Kaemifera galanga*]	-	4 kalanju (20g)
Kirambu [Bark of *Syzygium aromaticum*]	-	4 kalanju (20g)
Dhevatharam [Wood of *Cedrus deodra*]	-	4 kalanju (20g)
Athividayam [Root of *Aconitum heterophyllam*]	-	4 kalanju (20g)
Chukku [Tuber of *Gingiber officinale*]	-	4 kalanju (20g)
Milagu [Fruit of *Piper nigrum*]	-	4 kalanju (20g)
Thippili[Fruit of *Piper longum]*	-	4 kalanju (20g)

Purification of raw drugs:

Purification of Parangipattai:

It is dried and then powdered and boiled in the steam of milk(pittaviyal)

[Ref: Sarakugalinsutheemuraigal page :11]

Purification of Chukku:

Soak in lime stone water for a period of time and dry it in shade then peel off the outer layer.

[Ref: Sarakugalinsutheemuraigalpg .6]

Purification of Milagu:

Soak in butter milk for a period of 1 saamam (3 hours) then allow it to dry.

[Ref: SikichaRathinaDeepamEnnumVaithiyaNool page 28]

Purification of Thippili:

Soak in juice of Lime for a period of time then allow it to dry.

[Ref: Sarakugalinsutheemuraigal page 7]

Purification of Kadukkai

Remove the nut and use the outer covering of the drug

[Ref: Sarakugalinsutheemuraigal Page :4]

Purification of Nellimulli:

Remove the nut and use the outer covering of the drug

[Ref: Sarakugalinsutheemuraigal page :9]

Purification of Thandrikai:

Remove the nut and use the outer covering of the drug

[Ref: Sarakugalinsutheemuraigal page 7]

Purification of Athimathuram:

Clean in pure water then remove the outer covering and cut into small pieces and then dry it

Purification of Elavangam:

Dry it in sunlight and fry

[Ref: Sarakugalinsutheemuraigal page :6]

METHOD OF PREPARATION

All the above raw drugs are purified, were pulverized and sieved by a cloth and stored in a clean container

EXTERNAL MEDICINE-:VAATHA MEGA NAARAYANA ENNAI

Ingredients:

Punguennai[Oil of *Pongamiapinnata*]	-	5 palam(17.5g)
Veappaennai[Oil of *Azadiractaindica*]	-	5 palam(17.5g)

Vilakkennai[Oil of *Ricinuscommunis]*	-	5 palam(17.5g)
Nallennai[Oil of *Sesamumindicum*]	-	5 palam(17.5g)
Milk	-	¼ padi (325ml)
Kaadi[Vinegar].	-	½ padi (650ml)
Kodiveli[Root of *Plumbago indigo*]	-	5 palam(17.5g)
Milagu[Fruit of *Piper nigrum*]	-	5 palam(17.5g)
Vasambu[Rhizome of *Acoruscalamus*]	-	5 palam(17.5g)
Kadugarohini Root of *Picrorhizascrophulariflora*]	-	5 palam(17.5g)
Porithakaayam[Resin of *Ferullaasafetida*]	-	5 palam(17.5g)
Sathakuppai[*Anethumgraveolens*]	-	5 palam(17.5g
Chukku[Rhizome of *Zingiberofficinale*]	-	5 palam(17.5g
Thippili[Fruit of *Piper longum*]	-	5 palam(17.5g
Velulli[Bulb of *Allium sativum*]	-	5palam(17.5g
Kirambu[Flower of Syzygiumaromaticum]	-	5palam(17.5g
.Oomam[Seed of *Trachyspermumammi*]	-	5palam(17.5g
Vaividangam[Seed of *Embeliariben*]	-	5palam(17.5g

Preparation:

The purified raw drugs were dried, pulvarised by kalvam and made into karam by adding Kaadithen mixed with oil and then boiled till it attained the suitable consistency.

Drug storage:

The trial drug vatha chooranam is stored in a glass jar and vaatha mega naarayana ennai is stored in clean and dry narrow mouthed bottles.

Dispensing:

The drug vatha chooranam is given in powder form in packets and vaatha mega naarayana ennai is given in plastic bottles.

PRECLINICAL STUDY

CHEMICAL EVALUATION

Experimental procedure:

5 g of Vaatha Chooranam was taken in a 250 ml of clean beaker and 50ml of distilled water was added to it. Then it was boiled well for about 10 min. Then it is allowed to cool and filtered in a 100 ml volumetric flask and made up to 100 ml with distilled water. This preparation is used for the qualitative analysis of acidic/ basic radicals and biochemical constituents in it.

Preparation of extract:

5gm of *Vaatha Chooranam* is weighed accurately and placed in a 250ml clean beaker and 50ml of distilled water was added with it. Then it was boiled well for about 10 minutes. Then it was allowed to cool and filtered in a 100ml volumetric flask and made up to 100ml with distilled water. The bio-chemical analysis of *Vaatha Chooranam* was done at Biochemistry lab, National Institute of siddha, Chennai-47.

Preliminary test for Copper, Sodium, Silicate and Carbonate:

- **Test for Silicate:**
  a. A little (500mg) of the sample is shaken well with distilled water.
  b. A little(500mg) of the sample is shaken well with con. HCl/Con. H_2So_4.
- **Action of Heat:** A small amount (500mg) of the sample is taken in a dry test tube and heated gently at first and then strong.
- **Action of Heat:** A small amount (500mg) of the sample is taken in a dry test tube and heated gently at first and then strong.
- **Flame Test:** A small amount (500mg) of the sample is made into a paste with con. HCl in a watch glass and introduced into non-luminous part of the Bunsen flame.
- **Ash Test:** A filter paper is soaked into a mixture of sample and dil. cobalt nitrate solution and introduced into the Bunsen flame and ignited.

Test For Acid Radicals

- **Test For Sulphate:**2ml of the above prepared extract was taken in a test tube and 2ml of 4% dil. ammonium oxalate solution was added.
- **Test For Chloride:**2ml of the above prepared extracts was added with 2ml of dil-HNO_3 until the effervescence ceases off. Then 2 ml of silver nitrate solution was added.
- **Test For Phosphate:** 2ml of the extract was treated with 2ml of con.HNo3 and 2ml of dil. ammonium molybdate solution.
- **Test For Carbonate:** 2ml of the extract was treated with 2ml dil. magnesium sulphate solution
- **Test For Nitrate:**1gm of the substance was heated with copper turning and concentrated H_2SO_4 and viewed the test tube vertically down.
- **Test For Sulphide:** 1gm of the substance was treated with 2ml of con. HCL
- **Test For Fluoride & Oxalate:** 2ml of extract was added with 2ml of dil. Acetic acid and 2ml dil. calcium chloride solution and heated**.**
- **Test For Nitrite:** 3drops of the extract was placed on a filter paper, on that-2 drops of dil. acetic acid and 2 drops of dil. Benzidine solution were placed.

Test For Basic Radicals

- **Test For Lead:** 2ml of the extract was added with 2ml of dil. potassium iodine solution.
- **Test For Copper:** One pinch (50mg) of substance was made into paste with con. HCl in a watch glass and introduced into the non-luminous part of the flame.
- **Test For Aluminium:** In the 2ml of extract dil. sodium hydroxide was added in 5 drops to excess.
- **Test For Iron:**

  a.To the 2ml of extract add 2ml of dil. ammonium solution

  b. To the 2ml of extract 2ml thiocyanate solution and 2ml of con HNo3 is added
- **Test For Zinc:** In 2ml of the extract dil.sodium hydroxide solution was added in 5 drops to excess and dil.ammonium chloride was added.

- **Test For Calcium:** 2ml of the extract was added with 2ml of 4% dil.ammonium oxalate solution
- **Test For Magnesium:** In 2ml of extract dil.sodium hydroxide solution was added in drops toexcess.
- **Test For Ammonium:**In 2ml of extract 1 ml of Nessler's reagent and excess of dil. sodium hydroxide solution were added.
- **Test For Potassium:**A pinch (25mg) of substance was treated with 2ml of dil. sodium nitrite solution and then treated with 2ml of dil. cobalt nitrate in 30% dil. glacial acetic acid.
- **Test For Sodium:** 2 pinches (50mg) of the substance was made into paste by using HCl and introduced into the blue flame of Bunsen burner.
- **Test For Mercury:** 2ml of the extract was treated with 2ml of dil. sodium hydroxide solution.
- **Test For Arsenic:** 2ml of the extract was treated with 2ml of dil. sodium hydroxide solution.

Other constituents

- **Test For Starch :** 2ml of extract was treated with weak dil. iodine solution
- **Test For Reducing Sugar:** 5ml of Benedict's qualitative solution was taken in a test tube and allowed to boil for 2 minutes and added 8 to 10 drops of the extract and again boil it for 2 minutes.
- **Test For The Alkaloids**:

a) 2ml of the extract is treated with 2ml of dil. potassium iodide solution.
b) 2ml of the extract is treated with 2ml of dil.picric acid.

- **Test For Tannic Acid:** 2ml of extract was treated with 2ml of dil. ferric chloride solution
- **Test For Unsaturated Compound:** In the 2ml of extract 2ml of dil. Potassium permanganate solution was added.
- **Test For Amino Acid:** 2 drops of the extract was placed on a filter paper and dried well, and then 20ml of Burette reagent was added in it.

TOXICITY STUDIES OF VAATHA CHOORANAM

To evaluate the safety profile of Vaatha chooranam short term and long term toxicity study carried out as followed. The principles of laboratory animal care were followed and the Institutional Animal Ethical Committee approved the use of animals and the study design. IAEC registered and approval number: (IAEC).(NIS/IAEC/III/05/29092016dated29.09.2016) for Short term toxicity study and Long term toxicity study

Experimental Animals:

Species	:	Wistar albino Rats
Sex	:	Male and Female
Age/weight at start of test	:	6 weeks/140-160g b.wt
Acclimatization Period	:	7 days prior to dosing
Housing	:	Polypropylene cages with bedding with Husk
Husbandry	:	12-h light/12-h dark cycle/ Room Temperature 22°C±3°C and relative Humidity30–70%
Feed and Water	:	Rodent pelleted feed RO purified water Ad *libitum*
Identification	:	Animals will be kept in Polypropylene

Cages and numbered

Experimentation Details of Short term Toxicity Study:

Groups/Treatment regimen	:	Grouped by randomisation
Test Guideline	:	WHO
Length of exposure to test substance	:	1 day
No of Animals	:	5 Female+ 5 Male / group
Control group	:	Vehicle (honey)
Test groups	:	Vaatha Chooranam2000 mg/kg.b.wt

The wistar albino rats of both sex weighing 150-200g will be obtained from authorized animal breeders of animal laboratory in TANUVAS, Madavaram, Chennai

and stocked in animal house at National Institute of Siddha, Chennai. Animals will be house in cage at 22°C±3°C andrelative humidity 30–70% and have free access to standard rat pellet diet (Sai Meera Foods Pvt. Ltd., Bangalore). The animals will be dosed with Vaatha chooranam by oral for one day and monitored for behavioural parameters for the first 4 hours after drug administration. Body weight of the animal will be monitored at weekly intervals. The animals that the die within this period will be subjected to necropsy. Remaining animals will be weighed and sacrificed under the injection of Pentathal Sodium on the 15thday of the Study period. The toxicological effect was assessed on the basis of mortality.

Preparation of Test Drug Doses:

Groups	No. of Rat
Group I: Vehicle control (honey)	10 (5M+5F)
Group II: test drug (VC)- 2000 mg/kg b.wt	10 (5M+5F)

***VC**- *Vaatha chooranam*

Route of administration

Oral route were selected because it is the normal route of clinical administration.

Administration of Dose

The animals were kept in fasting (only food was with held) for 12 hrs and weighed prior to dosing. Three animals were used for each step. A single dose of the solution (2000mg/kg) was consecutively administered by oral gavage using intubation cannula. Food was with held for another 4 hrs after dosing and administration of drug. As per the guide line the starting dose level was taken as 2000mg/kg body weight.

Observations:

Observations were made and recorded systematically and continuously observed after the substance administration as per the guidelines.

- ✓ ½ hour, 1 hour, 2 hour, 4 hour and up to 24 hours observation
- ✓ All rats will be observed twice daily on week days for 14 days
- ✓ Body weight per weekly one times
- ✓ Feed intake per day

Cage side observation

The animals were monitored for behavioral parameters like, Alertness, Aggressiveness, pilo erection, Grooming, Gripping, Touch Response, Motor Activity, Tremors, Convulsions, Muscle Spasm, Catatonia, Muscle relaxant, Hypnosis Analgesia, Lacrimation, Exophthalmos, Diarrhea, Writhing, Respiration, Mortality

Necropsy:

Necropsy includes gross examinations of the external surface of the body, all orifices, cranial, thoracic and abdominal cavities and their contents. Brain, eye, lungs, heart, spleen, liver, kidneys, adrenals, uterus, of all animals.

Experimentation Details of Long term Toxicity Study:

Experimental Animals:

Species	:	Wistar Albino Rats
Sex	:	Male and Female
Age/weight at start of test	:	6 weeks/140-160g b.wt
Acclimatization Period	:	7 days prior to dosing
Housing	:	Polypropylene cages with bedding with Husk
Husbandry	:	12-h light/12-h dark cycle/ Room temperature 22°C±3°C and Relative humidity 30–70%
Feed and Water	:	Rodent pelleted feed RO purified water ad *libitum*
Identification	:	Animals will be kept in Polypropylene cages and Numbered

Experimentation Details of Long Term Toxicity Study:

Groups/Treatment regimen	:	Grouped by randomisation
Test Guideline	:	WHO
Length of exposure to test substance	:	90 days
No of Animals	:	10 Female+10 Male / group
Control group	:	Vehicle (honey)

Test groups : Vaatha Chooranam (Low dose, Mid dose, High dose)

The 80 Wistar albino rats of both sex selected randomly. The animals were divided into four groups. Each groups consist at 20 animals. First group treated as vehicle control and second, third and fourth groups were treated with Vaatha chooranam Low dose (360 mg), Mid dose (900 mg) and High dose (1800 mg) respectively. The animals were dosed with Vaatha chooranam by oral for 90 days and are monitored for behavioural parameters for the first 4 hours after drug administration. Body weight of the animal was be monitored at weekly intervals. The animals that die within this period was be subjected to necropsy. Remaining animals was be weighed and sacrificed under the injection of Pentathal Sodium on the on the91$^{st\ day}$ of the study. Blood will be collected from the anesthetized animals from abdominal aorta. and the following investigations like Haematology, Biochemical analysis and Histopathology are done.

They above dose were fixed from the result of Long term toxicity study

Groups	No. of Rats
Group I: Vehicle control (honey)	20(10M+10F)
GroupII:Test drug (*VC*)- low dose (360mg/kg b.wt)	20(10M + 10F)
GroupIII: Test drug(*VC*) - Mid dose (900mg/kg.b.wt)	20(10M +10F)
GroupIV:Test drug(*VC*) High dose (1800 mg/kg b.wt)	20(10M +10F)

***VC-** Vaatha chooranam

Preparation and administration of dose:

Vaatha Chooranam was dissolved in honey to obtain concentrations of 1800mg/ml. It was administered to animals at the dose levels of 360mg/kg b.wt, 900mg/kg b.wt and 1800mg/kg b.wt. The test substance solutions were freshly prepared every two days once for 90days. The control animals were administered with honey as vehicle. Administration was given by oral, once daily for 90 consecutive days.

Observations:

Experimental animals were kept under observation through out the course of study For the following

- ✓ All rats will be observed twice daily on week days for 90 days
- ✓ Body weight per weekly one times
- ✓ Feed intake per day

Cage side observation

The animals were monitored for behavioral parameters like, Alertness, Aggressiveness, pilo erection, Grooming, Gripping, Touch Response, Motor Activity, Tremors, Convulsions, Muscle Spasm, Catatonia, Muscle relaxant, Hypnosis Analgesia, Lacrimation, Exophthalmos, Diarrhea, Writhing, Respiration, Mortality.

Gross necropsy:

Gross necropsy includes examinations of the external surface of the body, all orifices, cranial, thoracic and abdominal cavities and their contents. Brain, eye, lungs, heart, spleen, liver, kidneys, adrenals, uterus, of all animals.

Laboratory Investigations:

On the 91st day, the animals were fasted over night, then anesthetized to collect blood samples from the abdominal aorta in two tubes: one with EDTA for hematological parameters, another one without any anticoagulant and was centrifuged at 4000 rpm at 4°C for10 minutes to obtain the serum for biochemical parameters.

***Hematological Investigations*:**

Blood samples of control and experimental rats were analyzed for hemoglobin (Hb), total red blood corpuscles (RBC), white blood corpuscles (WBC) count, Mean corpuscular volume (MCV), Mean corpuscular hemoglobin (MCH) were calculated.

***Biochemical Investigations*:**

Serum samples of control and experimental rats were analysed for Bilirubin, Uric Acid, Creatinine, Triglyceride, Total Cholesterol, HDL, LDL, VLDL, using standard methods. Activities of glutamate oxaloacetate transaminase/Aspartate amino

transferase (GOT/AST) and glutamate pyruvate transaminase/ Alanine amino transferase (GPT/ALT) were estimated as per the colorimetric procedure.

Necropsy:

All the animals were sacrificed on the 91st day. Necropsy of all animals was carried out and the weights of the organs including liver, kidneys, spleen, brain, heart, lungs and stomach were recorded.

Histopathology:

The organs included liver, kidneys, spleen, brain, heart, lungs and stomach of the animals were preserved, and they were subjected to histopathological examination.

Histopathological investigation of the vital organs was done. The organ pieces (3-5µmthick) of the three different (low, mid, high) dose level was preserved and was fixed in 10% formalin for 24 hand was hed in running water. Samples were dehydrated in an auto technic on and then cleared in benzene to remove absolute alcohol. Embedding was done by passing the cleared samples through three cups containing molten paraffin at 50^{o}C and then in a cubical block of paraffin made by the "L" molds. It was followed by micro to me and the slides were stained with Haematoxylin-eosin.

CLINICAL STUDY

STUDY TYPE

An open clinical trial

STUDY PLACE

OPD & IPD of Ayothidass pandithar, hospital,

National Institute of Siddha, Chennai-47

STUDY PERIOD

18 months

SAMPLE SIZE

40 patients (Both in IPD and OPD)

SUBJECT SELECTION:

Patients reporting with symptoms of *Vali Azhal Keel Vayu* will be subjected to screening by screening Profoma. After screening they will be enrolled for the study fulfilling the inclusion criteria as said below:

INCLUSION CRITERIA:

- Age: 18- 60 years.
- Sex: Both male and female
- Any of the following three symptoms
    a. Pain and swelling in three are more joint
    b. Morning Stiffness
    c. Rheumatoid factor positive
    d. Deformities like Swan neck and Button hole
    e. Rheumatoid nodules
    f. Symmetrical joints involvement
- Patient willing to undergo Radiological investigation and for laboratory investigation.
- Patient willing to sign the informed consent.

EXCLUSION CRITERIA:

- Pregnancy and lactation
- Tubercular arthritis
- Gouty arthritis
- Diabetic Mellitus
- Malignant Hypertension
- Any other systemic illness

WITHDRAWAL CRITERIA:

- Intolerance to the drug and development of adverse reactions during drug trial.

- Poor patient compliance and defaulters.
- Patient turning unwilling to continue in the course of clinical trial.
- Occurrence of any other systemic illness

TESTS AND ASSESMENTS

A. Clinical assessment
B. Siddha investigation
C. Laboratory investigations
D. Radiological investigation

CLINICAL ASSESMENT

- Arthritis involving three or more joints
- Symmetrical joint involvement
- Morning stiffness
- Spindle shaped appearance of fingers
- Rheumatoid nodules
- Swelling of small joints of hands and foot.
- Swan neck deformity

B. SIDDHA SYSTEM EXAMINATION:

1. Naadi
2. Sparisam
3. Naa
4. Niram
5. Mozhi
6. Vizhi
7. Malam
8. Moothiram
    a. Neer kuri:
    b. Nei Kuri:

C. ROUTINE INVESTIGATIONS

BLOOD

Hb

Total WBC Count

DC-

1. Polymorphs
2. Lymphocytes
3. Eosinophils
4. Monocytes
5. Basophils

Total RBC count

ESR ½ Hr: 1 Hr :

Blood sugar Fasting: PP :

Serum cholesterol

URINE

Albumin

Sugar (F) (PP)

Deposits

RENAL FUNCTION TESTS

Blood Urea

Serum creatinine

LIVER FUNCTION TESTS

Serum Total bilirubin

Direct bilirubin

Indirect bilirubin

Serum Alkaline phosphatases

SGOT

SGPT

C. SPECIFIC INVESTIGATIONS

CRP,

RA factor,

ASO Titre,

Uric acid

DATA COLLECTION FORMS:

Required information will be collected from each patient by using following forms.

FORM I	**:**	Screening and Selection Proforma
FORM II	**:**	History Taking Proforma
FORM III	**:**	Laboratory Investigation form
FORM IV	**:**	Consent Form
FORM V	**:**	Withdrawal Form and Pharmacovigilance Form
FORM Vl	**:**	Compliance form
FORM VII	**:**	Patient Information Sheet
FORM VIII	**:**	Dietary Advice form

STUDY ENROLLMENT

Patients reporting at the OPD of NIS with the clinical symptoms of VALI AZHAL KEEL VAYU will be examined clinically. Based on the inclusion and exclusion criteria, they will be enrolled for the study.

The patients who are going to be enrolled would be informed about the study, trial drug, possible outcomes and the objectives of the study in their vernacular language. After ascertaining the patient's willingness, informed consent would be obtained in written form.

All these patients will be given unique registration card in which patients' Registration number of the study, Address, Phone number and Doctors phone number etc. will be given, so as to report easily should any complications arise.

Complete clinical history, complaints and duration, examination findings and laboratory findings would be recorded in the prescribed Proformas. Patients would be advised to take the trial drug and appropriate dietary advice.

CONDUCT OF THE STUDY:

Purgation with Meganatha kulikai– 2 od with hot water in empty stomach at early morning with Hot Water will be given for balancing the deranged Mukuttram on the first day of the treatment.

The next day onwards the trial drug *Vatha chooranam* (Internal) and *Vaatha Mega Naarayana Ennai* (External) is given for 48 days. OPD patients are asked to visit the hospital once in 7 days. At each clinical visit clinical assessment is done and prognosis will be noted. For IPD patients the clinical assessment will be done daily with the supervision of the faculty member in the Ward. 20 patients in IP ward with the trial medicines. The results will be compared at the end of the study. Laboratory investigations and radiological investigation are done on the first day and 49th day of the trial. At the end of the treatment, the patients will be advised to visit the OPD for follow-up for futher 2 months for observing any recurrence. Defaulters will not be allowed to continue and be withdrawn from the study.

DATA ANALYSIS:

After enrolling the patient in the study, a separate file will be maintained for each and every patient and all forms and other information will be kept in the file. The screening forms will be filed separately. The data entry will be monitored by the Head of the department and faculties of the concerned department. All collected datas will be statistically analysed by Senior Research Officer (Statistics) for logical errors and incompleteness of data to avoid any bias. No modification in the results is permitted for unbiased reports. Then final report will be generated

ADVERSE EFFECTS/SERIOUS EFFECTS MANAGEMENT:

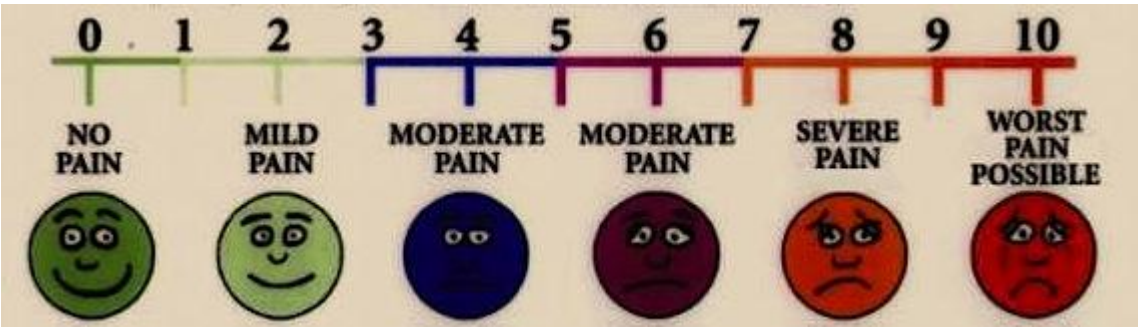
In this Study No Adverse Reactions Were observed during the course of treatment

OUT COME OF THE RESULT.

The outcome of the result is assessed by universal pain scale and restricted movement scale before and after treatment. Rheumatoid Arthritis Patients are included for the study based on EULAR SCALE Criteria

OUTCOME

i. UNIVERSAL PAIN ASSESMENT SCALE:



0 : No Pain

1-3 : Mild pain

4-6 : Moderate pain

7-10 : Severe pain

ii. RESTRICTED MOVEMENT ASSESSMENT SCALE:GRADATION OF MOVEMENTS

Grade 1 – Able to perform normal duties

Grade II – Moderate Restriction – Self-care is possible

Grade III – Marked restriction – Limited self-care /some assistance Required.

Grade IV – Confined to bed or wheel chair

(Ref: Clinical manual for nursing practice (National Institute of Health Warren Grant Magnuson Clinical Centre)

Rheumatoid Patients are Assessed for the study based on EULAR SCALE Criteria

iii. EUROPEAN LEAGUE AGAINST RHEUMATISM CLASSSIFICATION CRITERIA FOR RHEUMATOID ARTHRITIS

Classification criteria for RA (Add score of categories A-D;A Score of > or=6/10 is needed for classification of a patient as having definite RA

A .Joint involvement	
1 large joints	0
2-10 large joints	1
1-3 small joints (with or without involvement of large joints)	2
4-10 small joints (with or without involvement of large joints)	3
>10 joints (at least 1 small joint)	5
B. Serology (at least 1 test result is needed for classification)	
Negative RF and negative ACPA	0
Low-positive RF or low positive	2
High-positive RF or high-positive ACPA	3
C. Acute –phase reactants (at least 1 test result is needed for classification	
Normal CRP and normal ESR	0
Abnormal CRP or abnormal ESR	1
A. Duration of symptoms	
<6 weeks	0
≥6weeks	1

QUALITATIVE ANALYSIS

PHYSICO-CHEMICAL ANALYSIS

Table-1: Colour, nature of Vaatha Chooranam

S.no	Parameters	Results	Method of Testing
1.	Colour	Yellowish green	By visual
2.	Odour	Odour(Omam Smell)	Olfactory examination
3.	Solublity	Completely soluble	Qualitative
4.	Nature	Powder	By visual

Table-2: Test for Basic radicals

S.no	Procedures	Vaatha Chooranam
1.	Test for Ammonium	-
2.	Test for Sodium	-
3.	Test for Magnesium	-
4.	Test for Aluminium	-
5.	Test for Potassium	+
6.	Test for Calcium	-
7.	Test for Ferrous iron	+
8.	Test for Copper	-
9.	Test for Zinc	-
10.	Test for Arsenic	-
11.	Test for Mercury	-
12.	Test for Lead	-

Inference

Bio-chemical analysis for basic radicals reveals that Vaatha Chooranam contains Potassium, and Iron.

Table-3: Test for Acidic radicals

S.no	**Procedures**	Vaatha chooranam
1.	Test for Sulphate	-
2.	Test for Chloride	+
3.	Test for Phosphate	+
4.	Test for Flouride & Oxalate	-
5.	Test for Nitrate	_

Table-4: Test for Acidic radicals

S.no	**Procedures**	Vaatha Chooranam
1.	Test for Starch	-
2.	Test for Reducing sugar	-
3.	Test for Alkaloids	+
4.	Test for Amino acids	_
5.	Test for Tannic acids	+
6.	Test for type of compounds	No Change

Inference

Bio-chemical analysis for acid radicals reveals that Vaatha Chooranam contains Chloride, phosphate, Alkaloids, Tannic acids

Toxicity study Results of Vaatha Chooranam

Dose finding experiment and its behavioural Signs of Toxicity

No	Dose Mg/kg	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1.	Control	+	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-
2.	2000	+	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-

1.Aletness 2.Aggressiveness 3.pilo erection 4.Grooming 5.Gripping 6.Touch Response 7. Motor Activity 8. Tremors 9.Convulsions 10.Muscle Spasm 11.Catatonia 12.Muscle relaxant 13.Hypnosis 14.Analgesia 15.Lacrimation 16.Exophthalmos 17.Diarrhoea 18.Writhing 19. Respiration 20.Mortality

\+ Presence of Activity

\- Absence of Activity

All the data were summarized in the form of table revealed no abnormal signs and behavioural changes in rats at the dose of 2000 mg/kg body weight administered orally

Short term Toxicity study

In short term toxicity study, the test drug at Vaatha Chooranam for single dose(2000mg/kg b.wt) was administered.

There was no mortality or signs of toxicity observed after dosing Vaatha Chooranam 2000mg/kg body weight during the study period of 14 days. This indicate that the LD50 of Vaatha Chooranam is more then 2000mg/kg b.wt.

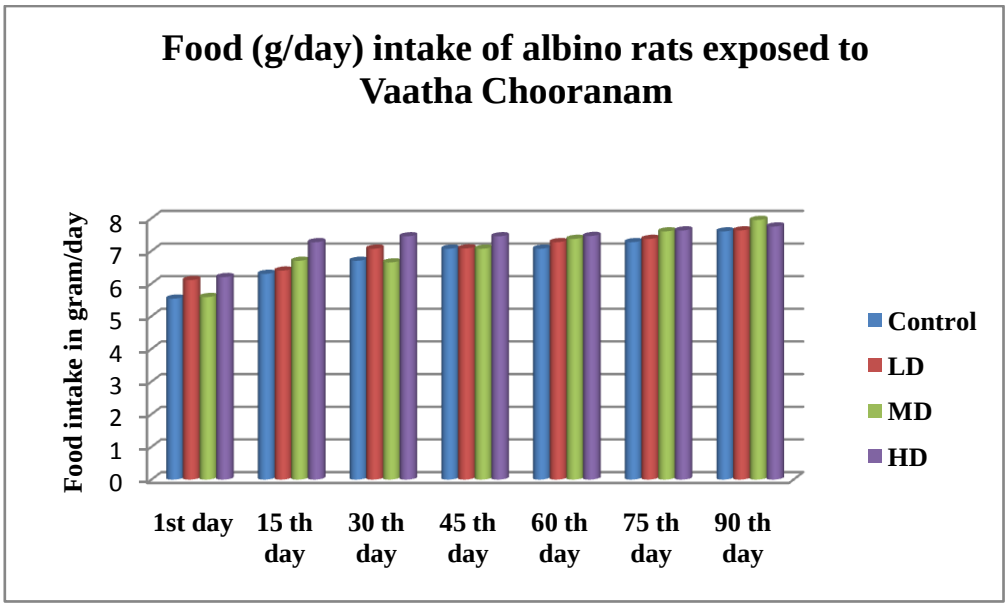
There was no changes in skin and fur, eyes and mucous membranes of all animals. The eating ,drinking habit, sleep pattern, locomotion were normal in all animals and no changes in body weight as compared to control group.

At the end of the 14 th day necropsy was done and there was no abnormality seen in test groups as compared to control group during the examination.

Food (g/day) intake of albino rats exposed to Vaatha Chooranam

Dose (mg/kg/day)	Control	LD	MD	HD
1st day	5.54±0.21	6.11±0.21	5.59±0.25	6.2±0.15
15 th day	6.3±0.18	6.4±0.21	6.7±0.27	7.27±0.27
30 th day	6.7±0.27	7.07±0.17	6.65±0.18	7.45±0.24
45 th day	7.07±0.17	7.08±0.18	7.07±0.17	7.45±0.25
60 th day	7.07±0.17	7.27±0.27	7.37±0.24	7.45±0.25
75 th day	7.27±0.27	7.37±0.24	7.60±0.28	7.63±0.25
90 th day	7.60±0.28	7.63±0.25	7.95±0.11	7.75±0.13

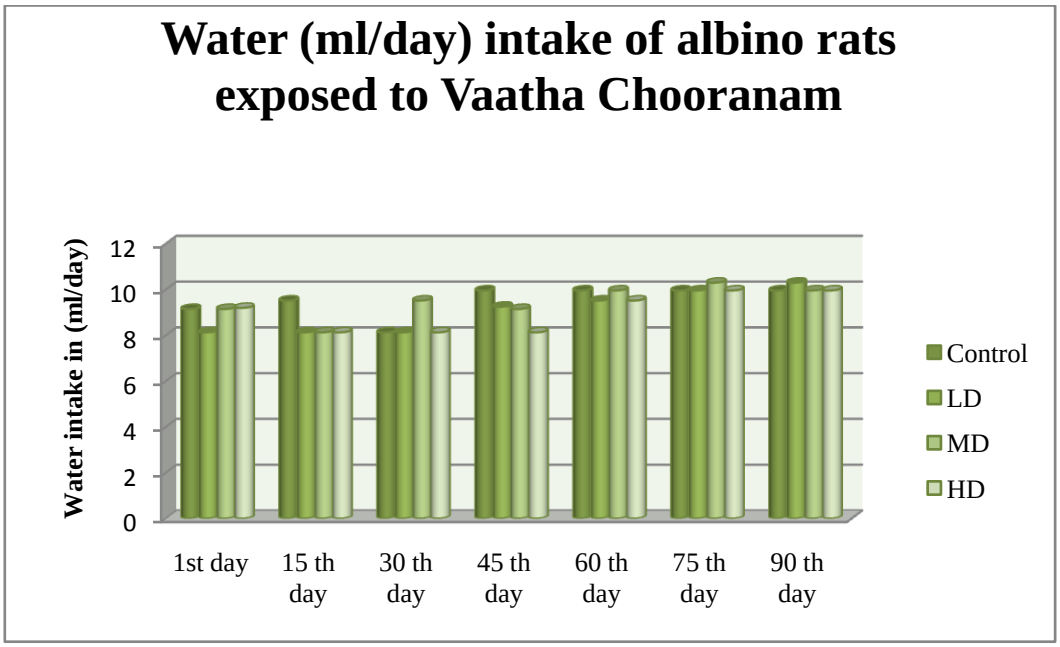
Values are mean± S.D. (Dunnett's test).*P<0.05,**P<0.01,N=12



Water (ml/day) intake of albino rats exposed to Vaatha Chooranam

Dose (mg/kg/day)	Control	LD	MD	HD
1st day (ml/rat)	9.15±0.13	8.13±0.12	9.15±0.12	9.20±0.15
15 th day (ml/rat)	9.52±0.21	8.13±0.12	8.13±0.12	8.13±0.12
30 th day (ml/rat)	8.13±0.12	8.13±0.12	9.52±0.21	8.13±0.12
45 th day (ml/rat)	9.96±0.11	9.25±0.17	9.15±0.12	8.13±0.12
60 th day (ml/rat)	9.96±0.11	9.52±0.21	9.96±0.11	9.52±0.21
75 th day (ml/rat)	9.96±0.11	9.96±0.11	10.30±0.13	9.96±0.11
90 th day (ml/rat)	9.96±0.11	10.30±0.13	9.96±0.11	9.96±0.11

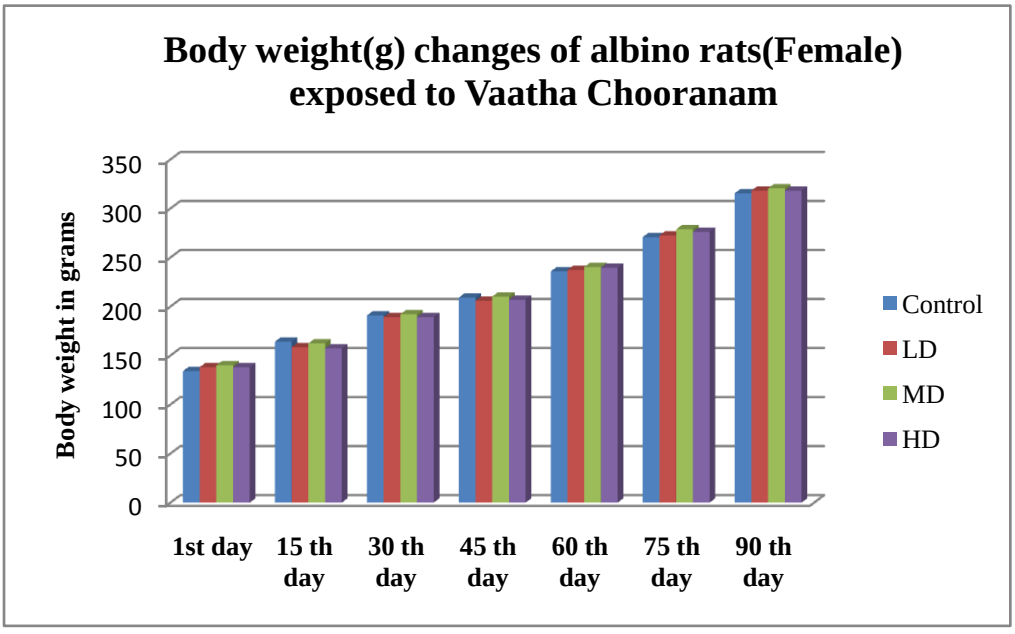
Values are mean± S.D. (Dunnett's test).*P<0.05,**P<0.01,N=12



Body weight (g) changes of albino rats (female) exposed to Vaatha Chooranam

Dose (mg/kg/day)	Control	LD	MD	HD
1st day	134.16±4.21	138.12±3.50	140.2±2.13	138.14±2.46
15 th day	164.16±4.21	158.45±2.16	162.36±5.07	157.25±1.67
30 th day	190.83±6.14	189.16±6.23	192.12±4.21	189.25±5.26
45 th day	209.16±5.07	206±4.21	210.2±6.30	207±3.16
60 th day	235.83±4.21	237.38±6.14	240.24±6.14	239.68±4.21
75 th day	270.83±6.30	272.5±5.02	278.8±2.36	276.26±6.24
90 th day	315.5±6.44	318.24±6.12	320.6±5.07	318.28±1.36

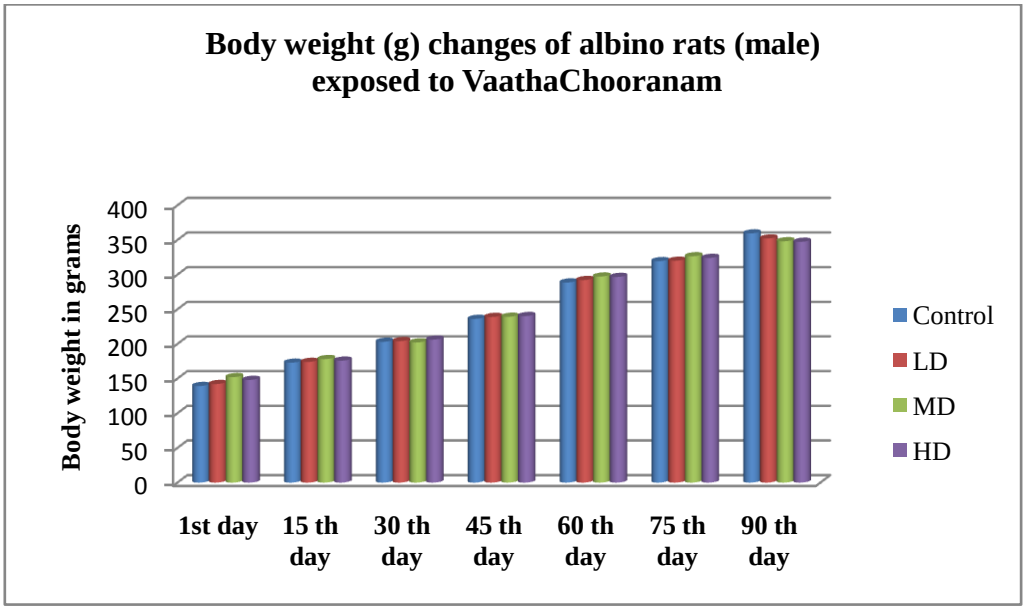
Values are mean± S.D. (Dunnett's test).*P<0.05,**P<0.01,N=12



Body weight (g) changes of albino rats (male) exposed to Vaatha Chooranam

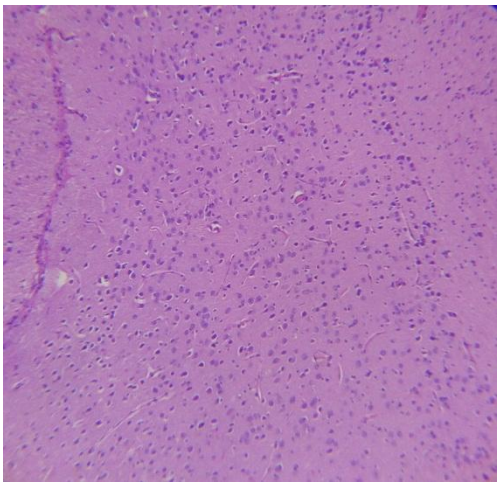
Dose (mg/kg/day)	Control	LD	MD	HD
1st day	139.33±4.13	142.24±4.12	152.16±2.45	148.16±6.27
15 th day	173±5.79	174.12±5.26	178.16±5.79	176±5.12
30 th day	203±5.79	204.16±4.23	202.18±9.12	206.33±2.4
45 th day	236.16±9.24	239±9.24	239.23±8.28	240.25±9.24
60 th day	288.66±9.24	292.25±6.23	297.26±5.20	296.67±2.67
75 th day	319.5±8.50	320.1±9.28	326.5±4.13	324.13±4.12
90 th day	359.5±9.71	352.18±6.58	348.16±7.02	347.4±8.50

Values are mean± S.D. (Dunnett's test).*P<0.05,**P<0.01,N=12



Histopathology of Brain

Low Power Magnification 10X



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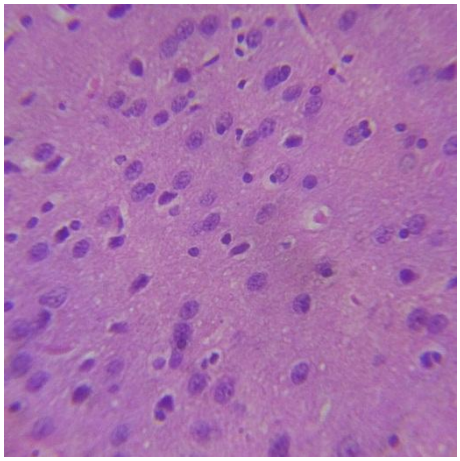
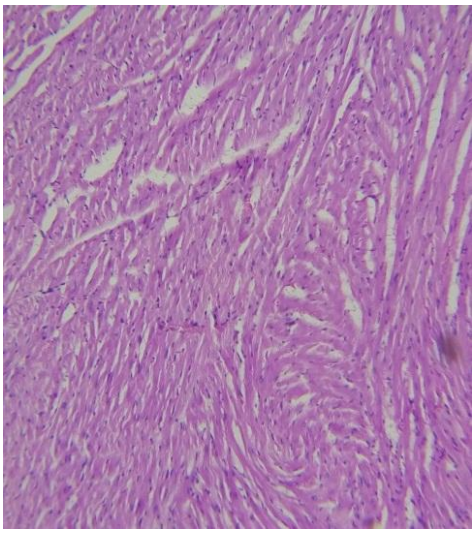


Histopathology of Heart

Low Power Magnification 10X



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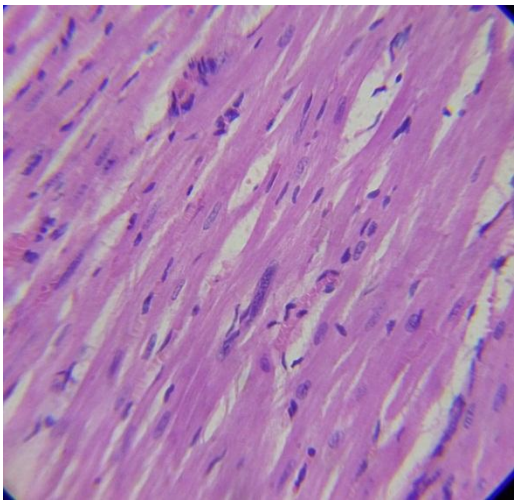
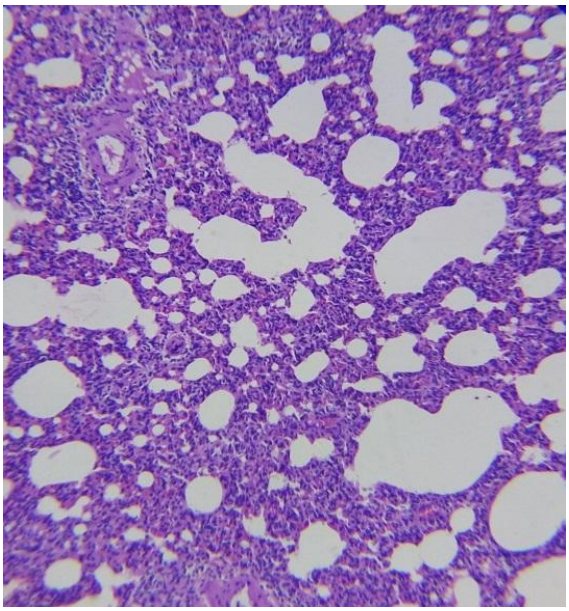


Histopathology of Lung

Low Power Magnification 10X



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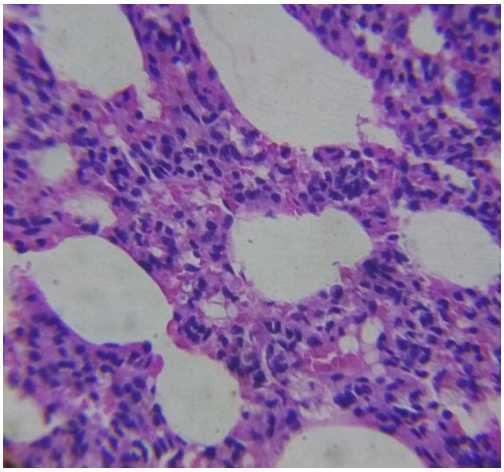
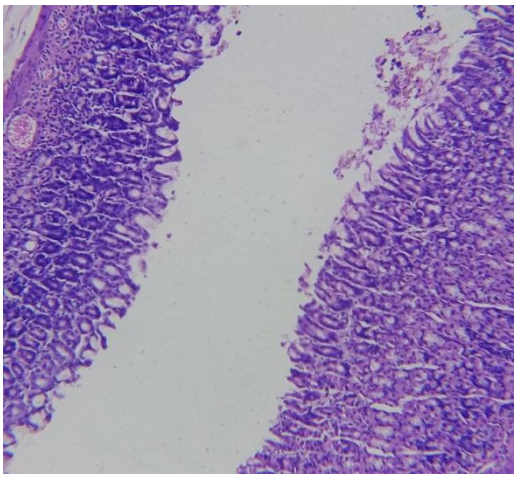


Histopathology of Stomach

Low Power Magnification 10X



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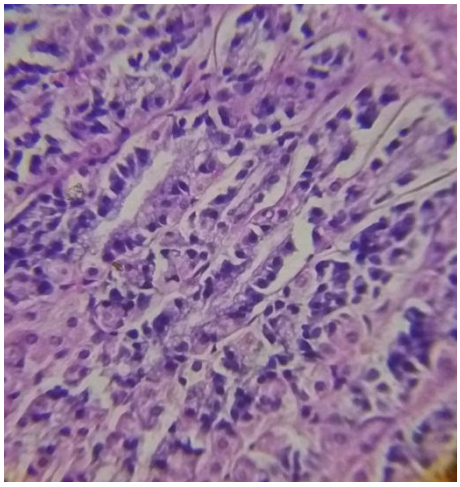
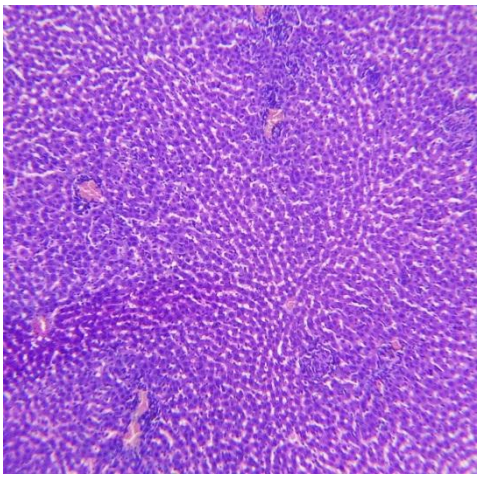


Histopathology of Liver

Low Power Magnification 10X



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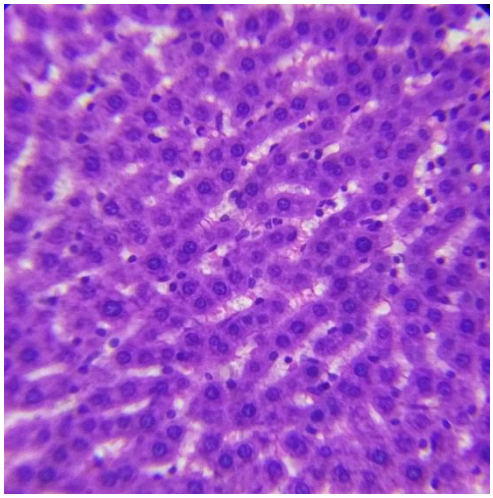
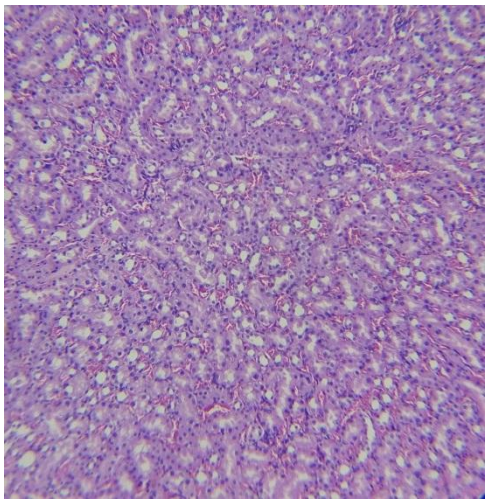
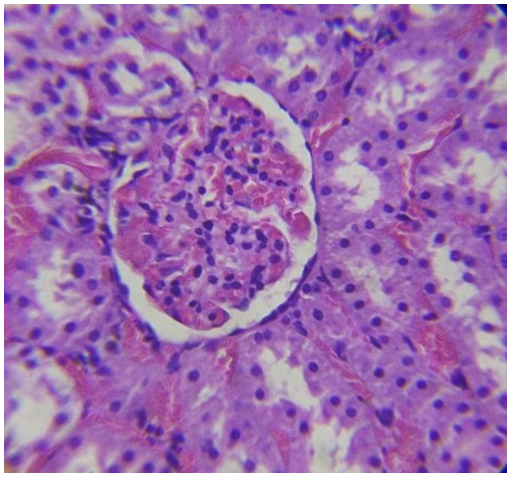


Histopathology of Kidney

Low Power Magnification 10X



High Power Magnification 40X



Histopathology of Spleen

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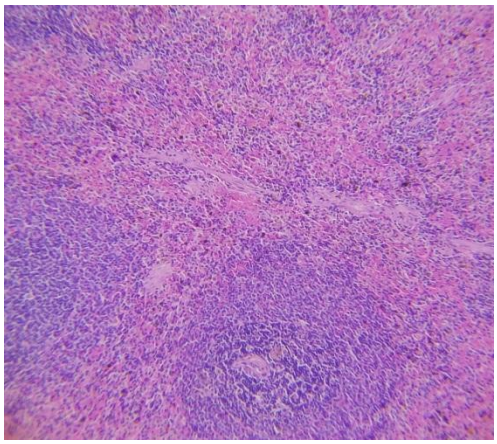

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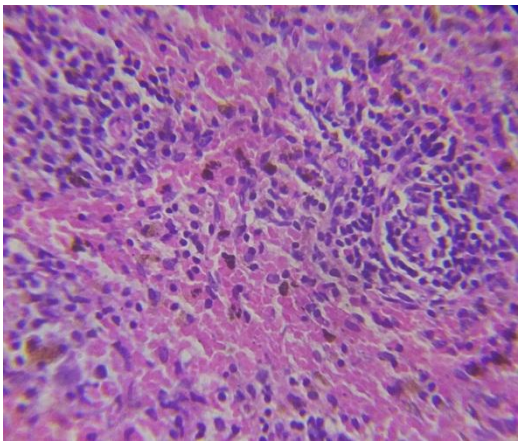

Histopathology of Uterus

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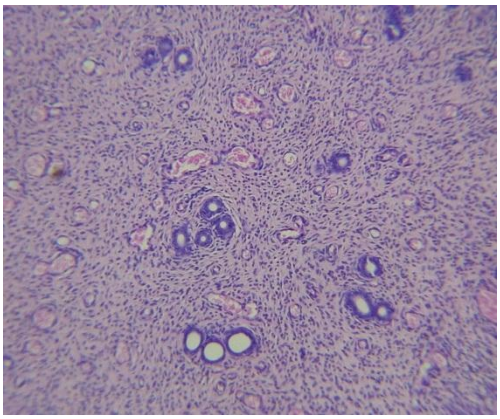

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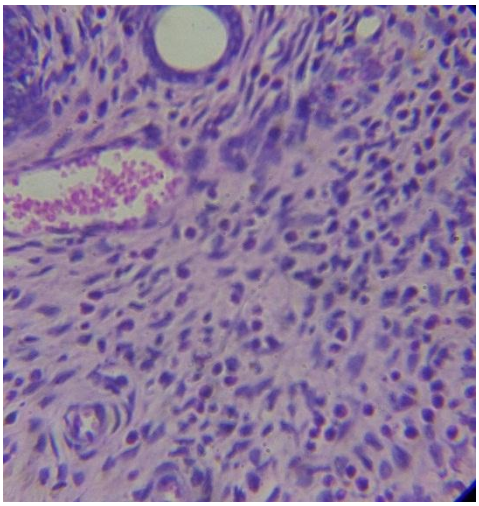

Histopathology of Ovary

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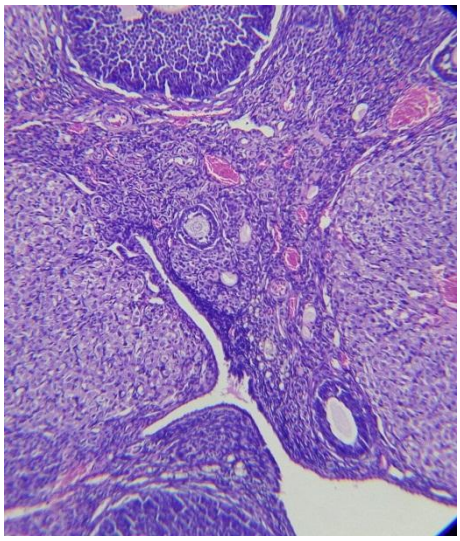

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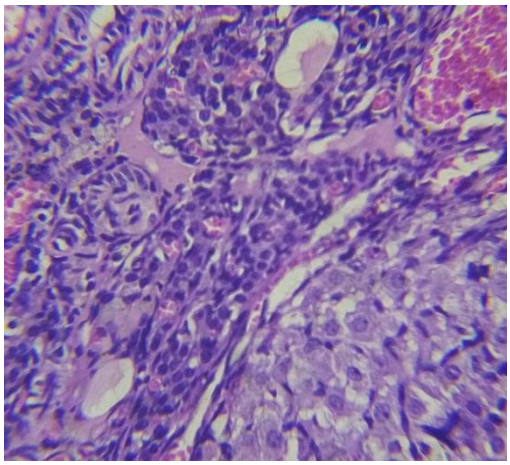


Histopathology Analysis Report

Group ID: C1HFH

Brain

- Regular marginal alignment on the neurons with promising histology were observed
- Morphology of neurons in CA1, CA2 and CA3 zones are normal

Lung

- Lung parenchyma appears normal with regular arrangement of alveoli and alveolar sac with no signs of lymphocyte infiltration and pulmonary fibrosis
- Pneuomocyte and capillary appears normal
- Alveolar sac and septa appears normal with signs of degeneration
- Pleura and brochioles appears normal
- Pulmonary vessels and bronchioles appears normal

Heart

- Myocardial cells appears normal with well-defined mycoplasma and prominent nucleus and nucleolus

Stomach

- Lamina propria appears normal with no evidence of infiltration and inflammation
- Mucosal wall appears normal with regular arrangement of connective tissue

Liver

- Cytoplasm appears normal with widen portal tract
- The centrilobular hepatocytes appears normal with stained cytoplasm
- Mild congestion of blood vessels were been observed

Kidney

- Glomerular cell integrity, basement membrane and nephrotic bundle appears normal
- No signs of lesion or inflammation were observed
- Proximal and distal convoluted tubule appears normal

Spleen

- No signs of perivascular inflammation
- Appearance of splenic sinuses, Splenic cord and endothelial orientation was normal
- Appearance of LF – lymphoid follicle; PALS – periarterial lymphoid sheath was normal with no significant signs of enlargement

Uterus

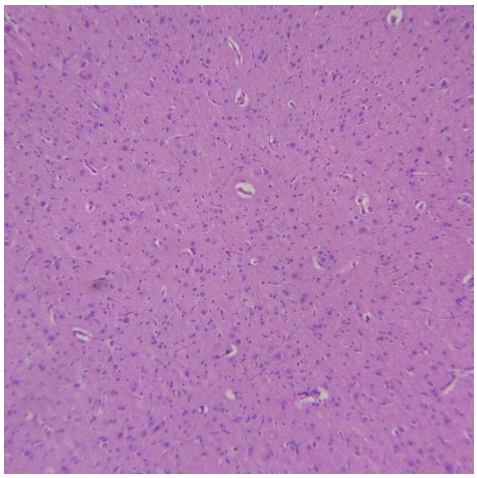
- Arrangement of stratum basale, functionale and surface epithelium seems normal

Ovary

- Sequential arrangement of granulosa cells arounds oocyte was normal and regular
- Follicular cells, cytoplasm and nucleus appears normal

Histopathology of Brain

Low Power Magnification 10X



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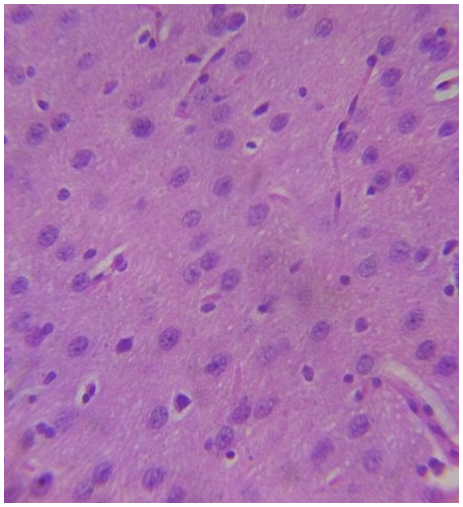

Histopathology of Heart

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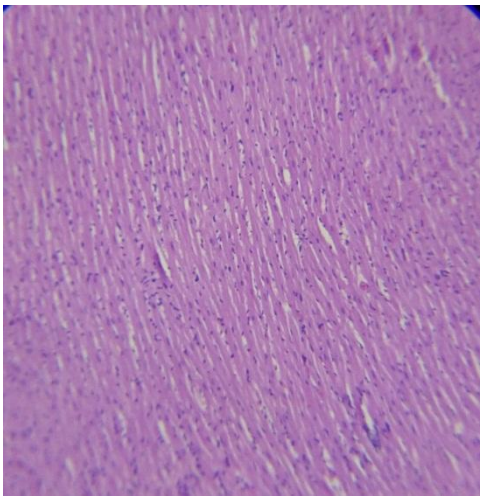

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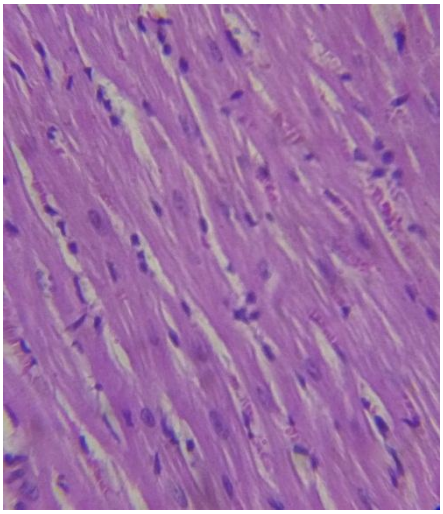

Histopathology of Lung

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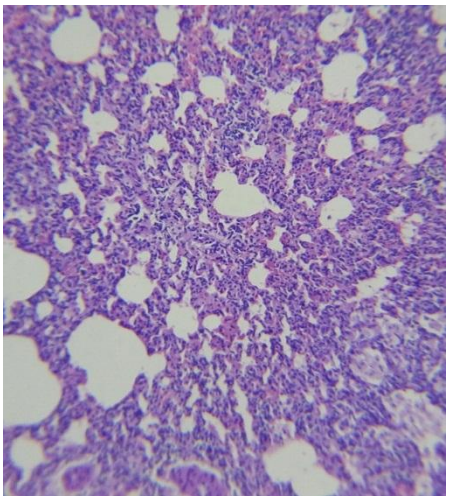

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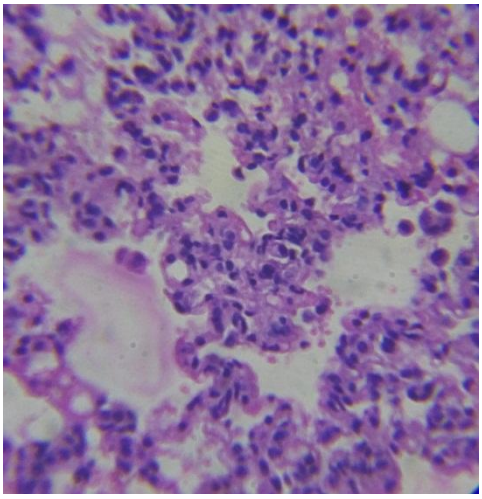

Histopathology of Stomach

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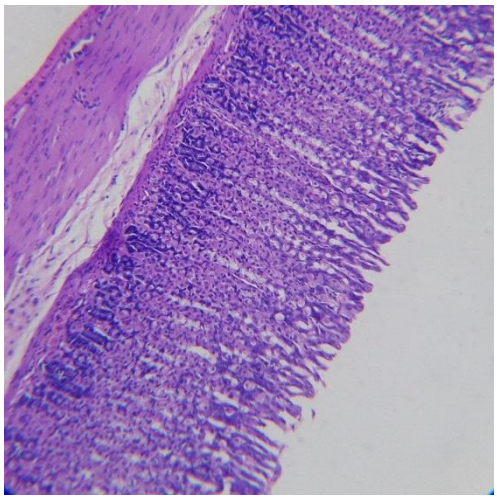

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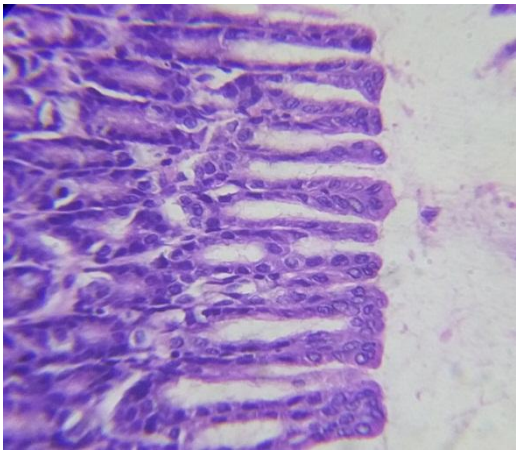

Histopathology of Liver

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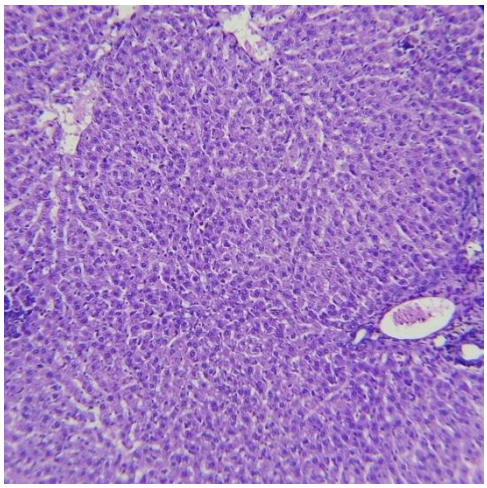

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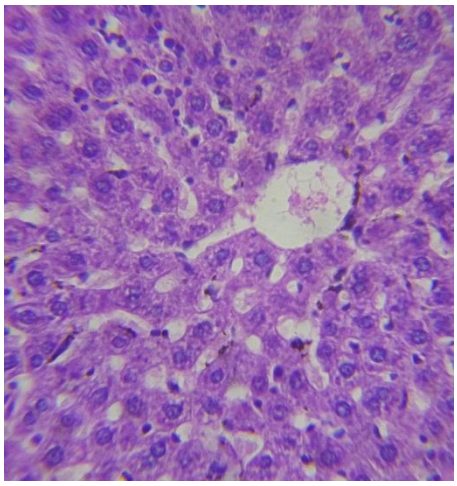

Histopathology of Kidney

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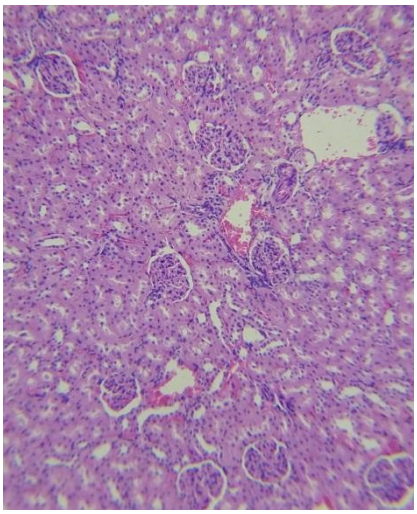

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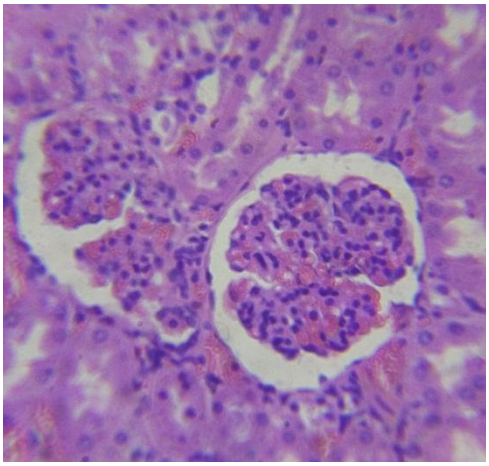

Histopathology of Spleen

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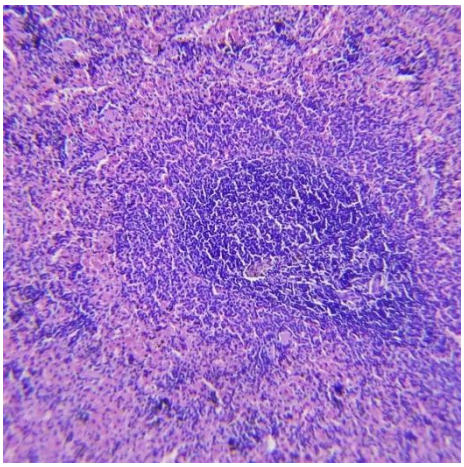

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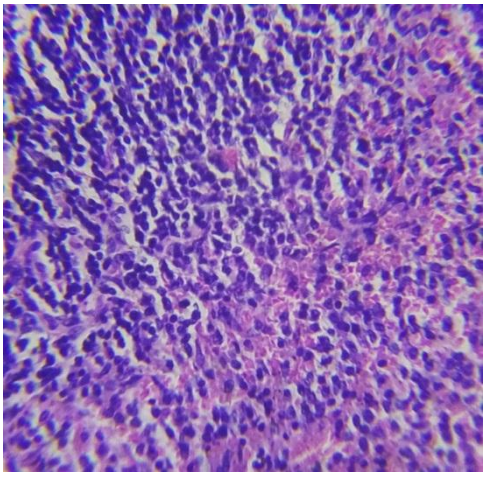
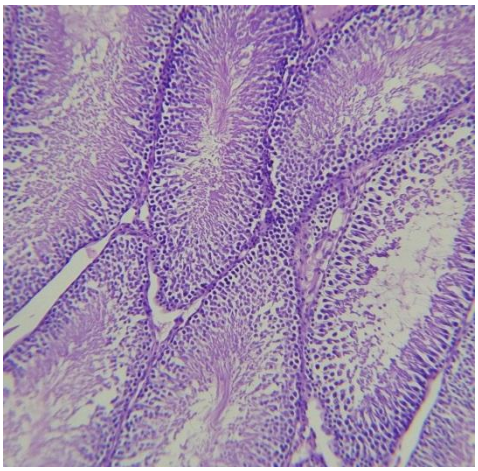


Histopathology of Testes

Low Power Magnification 10X



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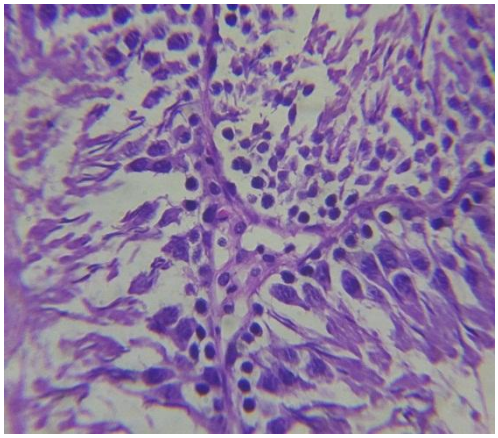


Histopathology Analysis Report

Group ID: C1HMH

Brain

- No signs of pyknosis and perineural vacuolization
- No signs of edema or degeneration were observed.
- Arrangement of neurons on cerebral cortex appears normal and dense

Lung

- Bronchial opening appears regular with no signs of infiltration
- Appearance of alveolar network was normal
- Nucleus of type I and II alveolar cells looks normal

Heart

- No evidence on accumulation of adipose tissue on interstitium
- No evidence of atherosclerosis and thrombosis

Stomach

- Gastric glands, gastric glands including secretary sheath appears normal
- Normal gastric mucosa containing intact gastric gland cells, parietal cells which are spherical cell with deeply stained dark nucleus

Liver

- The walls of the lumen appears normal with no evidence of ischemicchanges .
- No evidence of infiltration
- Rare appearance of Kupffer cells with no evidence of phagocytosis in intracytoplasmic region

Kidney

- Interstitial connective tissue appears cohesive with distinct space in between
- Glomeruli appear widen with prominent space at capsular junction
- Proximal and distal convoluted tubule appears normal
- No signs of cellular necrosis

Spleen

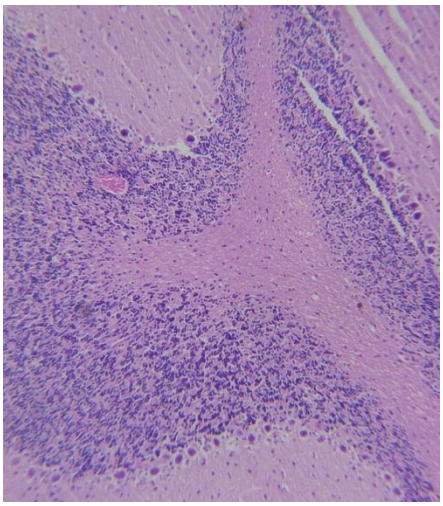
- Appearance of LF – lymphoid follicle; PALS – periarterial lymphoid sheath was normal with no significant signs of enlargement
- No signs of immunological activities

Testes

- Presence of mature somatic cells project the perfect histomorphology of testicular cells were observed. Primary spermatocytes with large centered nucleus and dense chromatin were observed
- Appearance of leydig cells, interstitial tissue , seminiferous tubule, Sertoli cells and spermatogonia were normal

Histopathology of Brain

Low Power Magnification 10X



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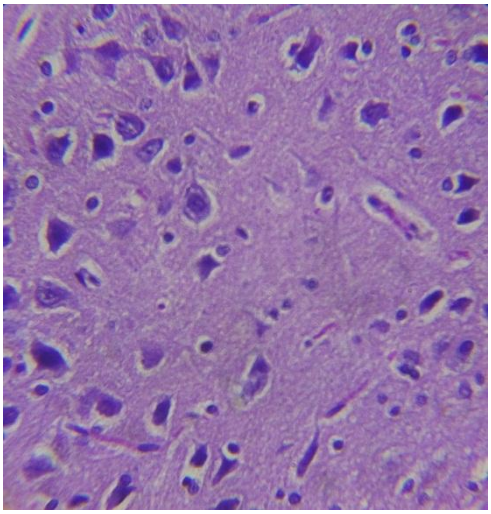
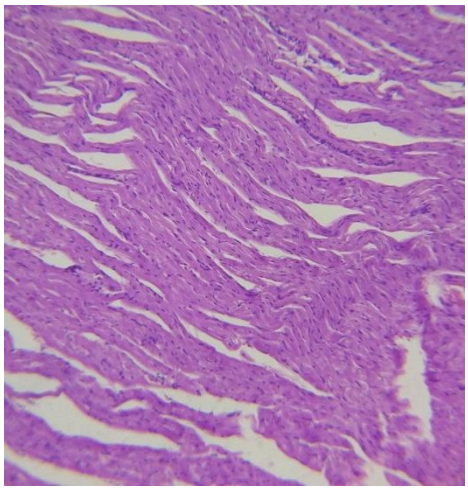


Histopathology of Heart

Low Power Magnification 10X



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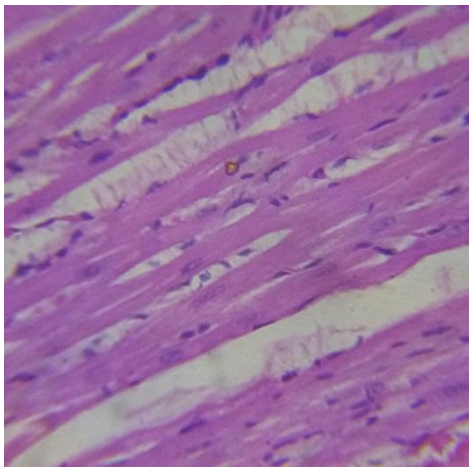

Histopathology of Lung

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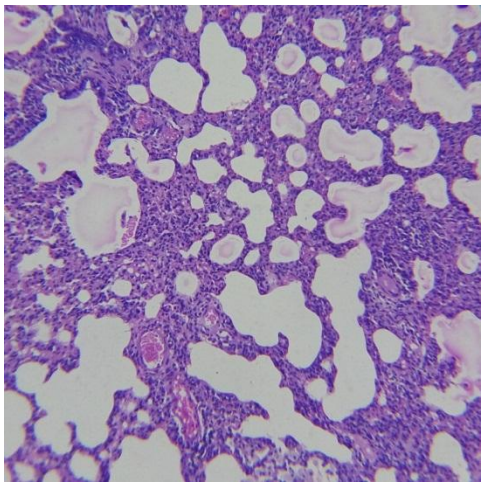

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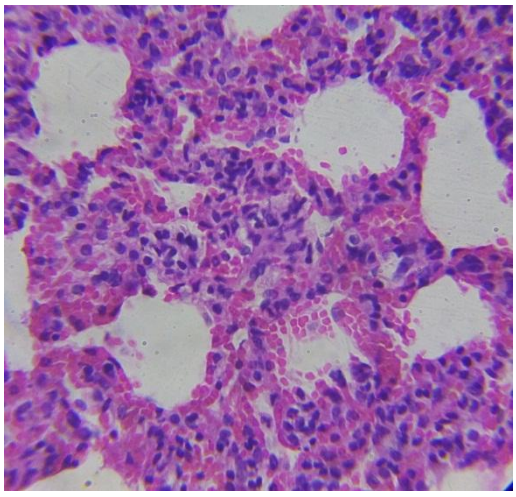

Histopathology of Stomach

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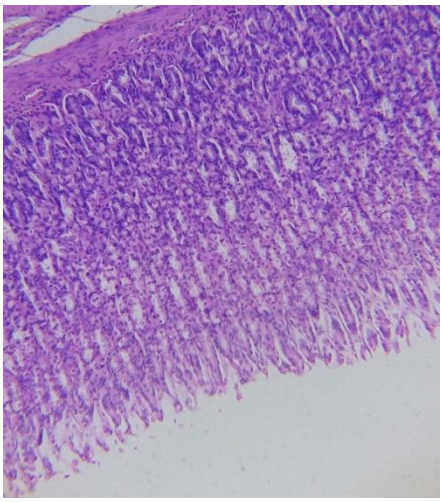

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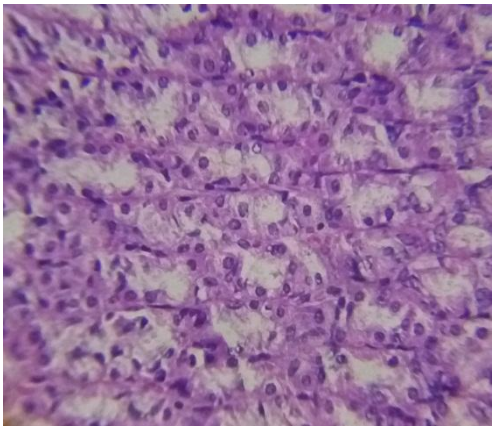
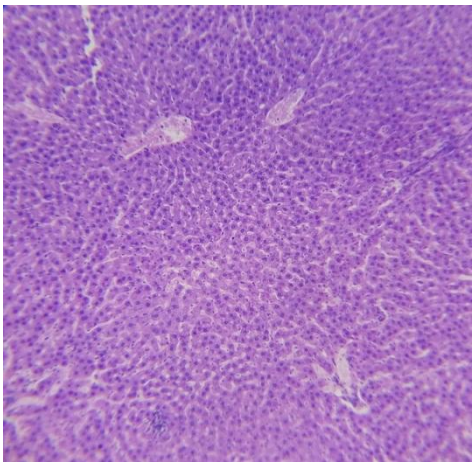


Histopathology of Liver

Low Power Magnification 10X



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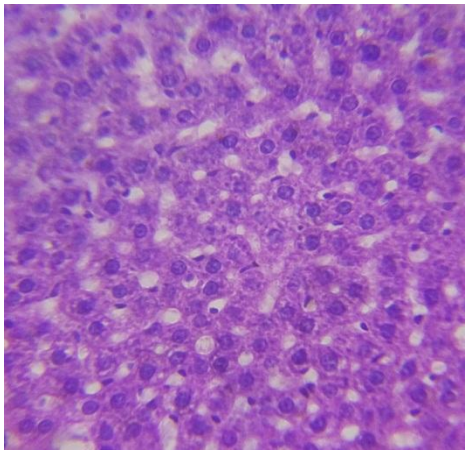

Histopathology of Kidney

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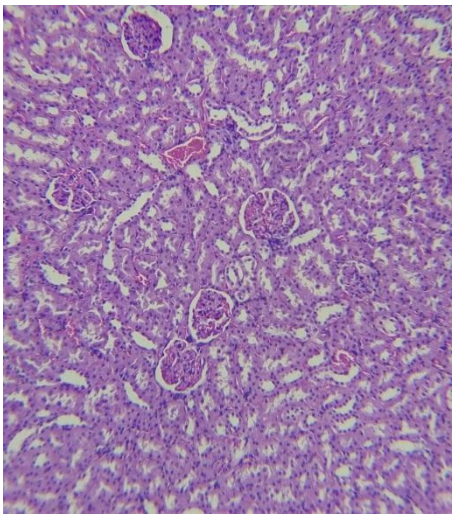

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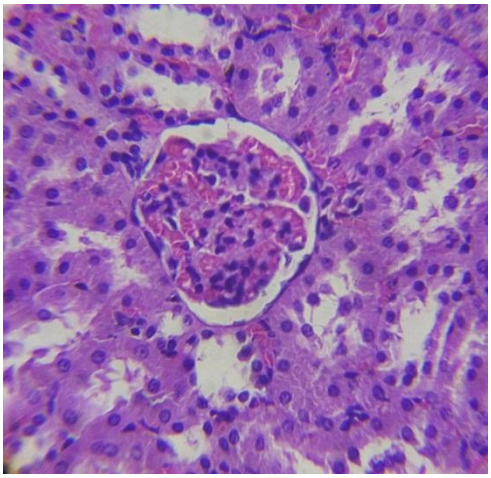

Histopathology of Spleen

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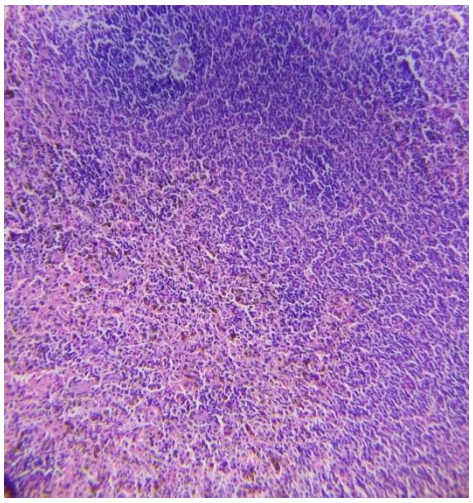

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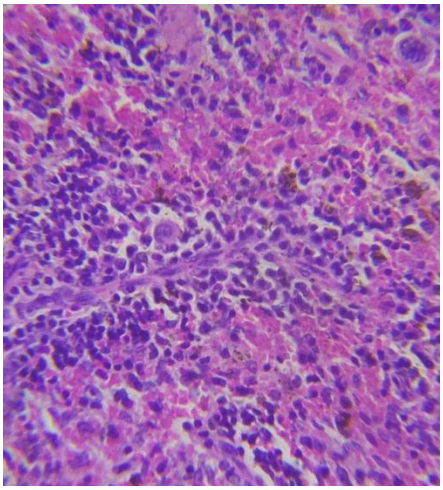

Histopathology of Uterus

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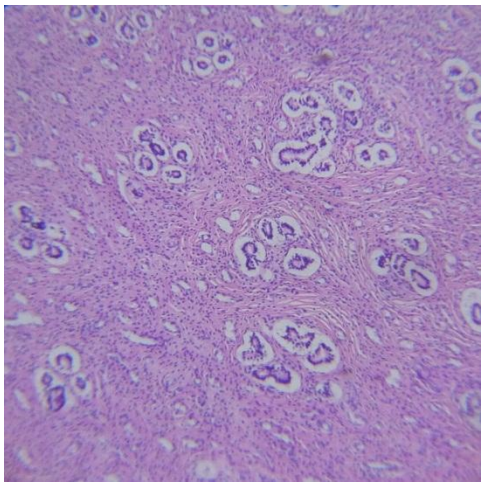

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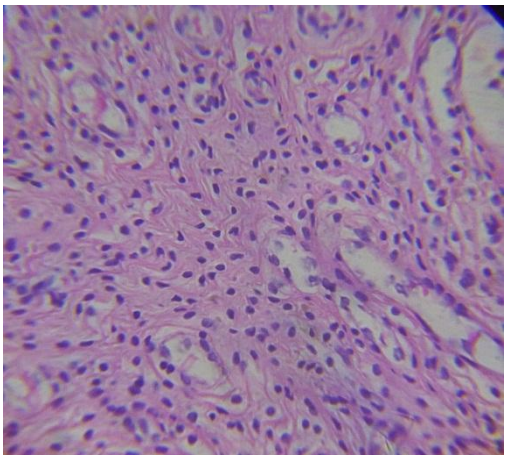
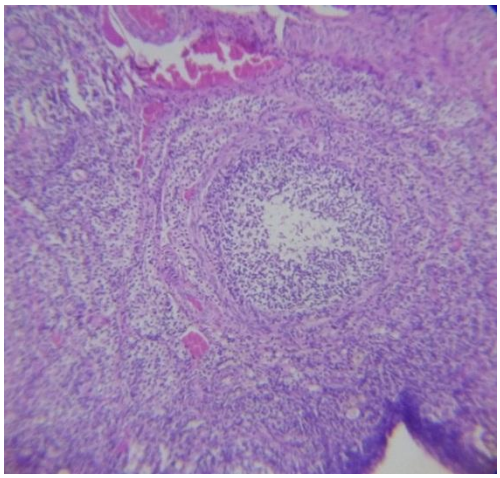


Histopathology of Ovary

Low Power Magnification 10X



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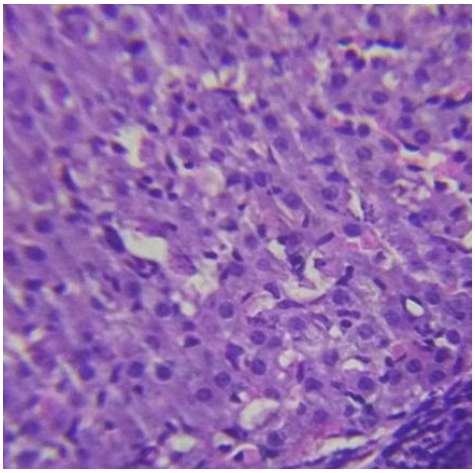


Histopathology Analysis Report

Group ID: C1LFH

Brain

Arrangement of the neurons appears intact with no sings of degeneration or apoptotic changes in both the samples

Cortex region showed normal neurons with polygonal to round cell bodies containing dense cytoplasm.

Heart

Appearance of myocyte was normal

Endocardium appears normal with no evidence of necrosis

Fibres appears normal elongated and rod shaped

Lung

- No signs of airway secretion and bronchial secretion
- Bronchial blood vessels and connective tissue appears normal with no sings of pulmonary edema

Stomach

- Regular arrangement of muscularisexterna and outer longitudinal muscle were observed
- Regular histology of Inner circular muscle (ICM), gastric pit (GP), and muscularis mucosae (MM) were observed

Liver

- Diffused vacuolar changes were observed in the mid zonal region
- Mild congestion on central vein was observed

Kidney

- Glomerular appears slightly dilated
- No signs of lesion or inflammation were observed
- Proximal and distal convoluted tubule appears normal
- Interstitial connective tissue of both the sample appear normal

Spleen

- Appearance of central artery and marginal sinus are normal
- No abnormalities found in lymph node of both the samples

Uterus

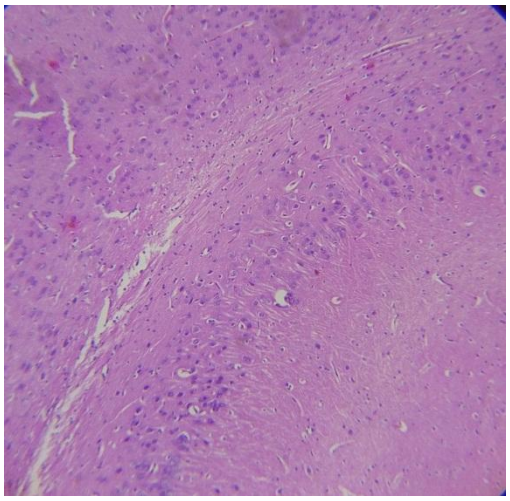
- Arrangement of stratum basale, functionale and surface epithelium seems normal

Ovary

- Appearance of antral follicle, primary oocyte and secondary follicles are normal

Histopathology of Brain

Low Power Magnification 10X



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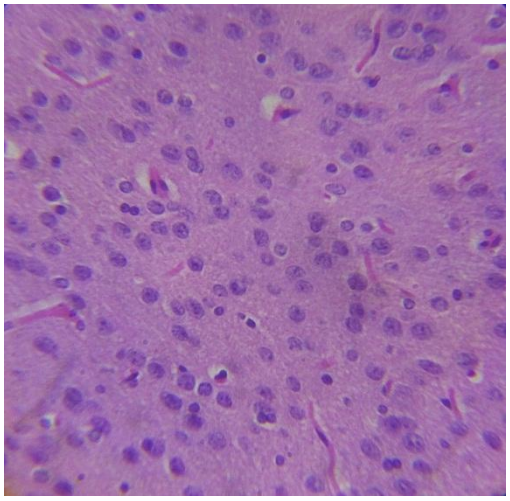
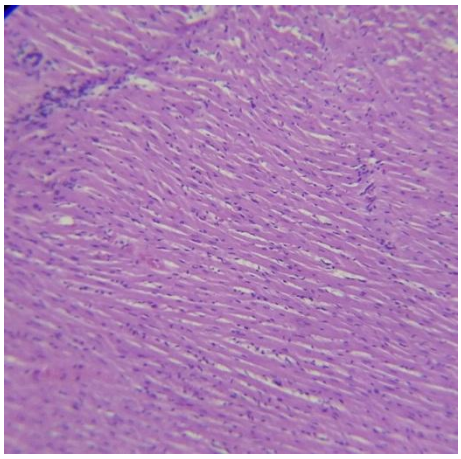


Histopathology of Heart

Low Power Magnification 10X



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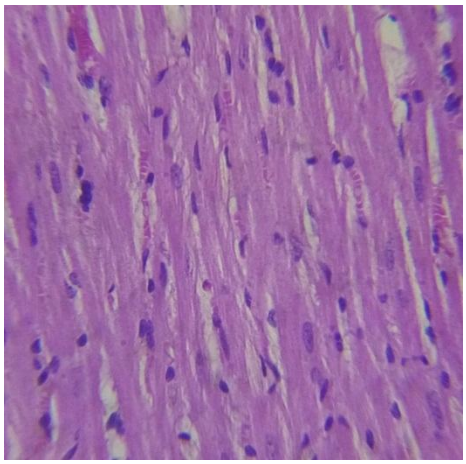
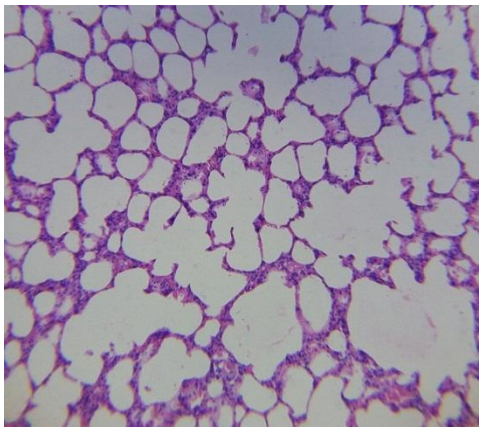


Histopathology of Lung

Low Power Magnification 10X



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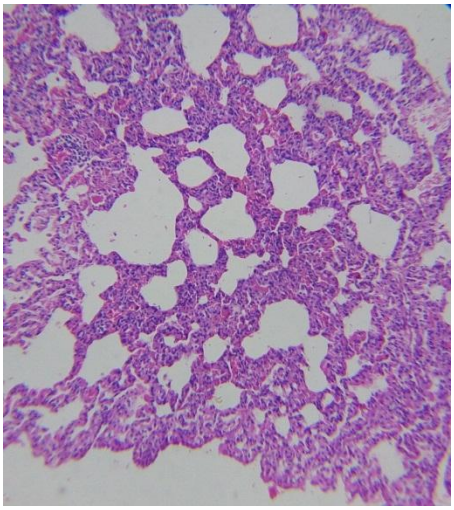

Histopathology of Stomach

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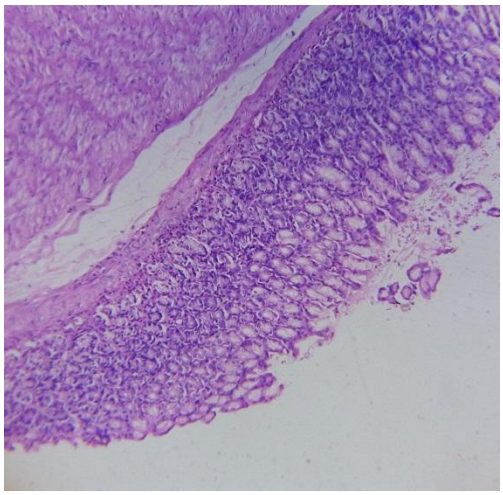

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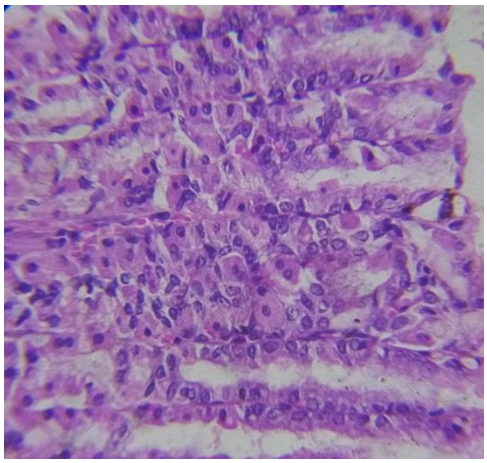

Histopathology of Liver

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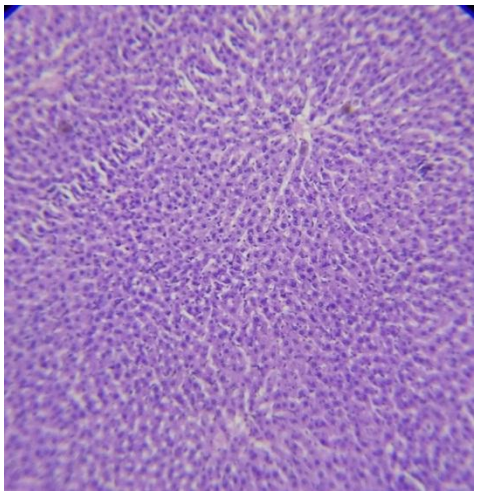

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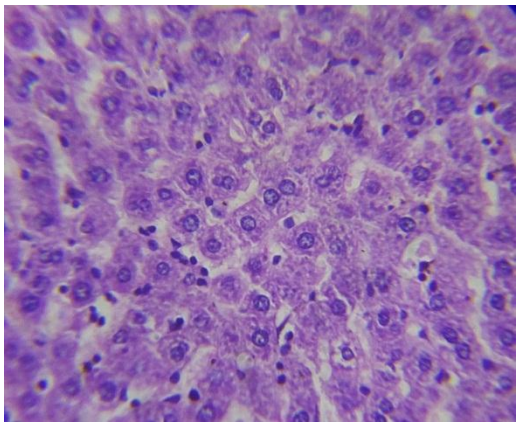
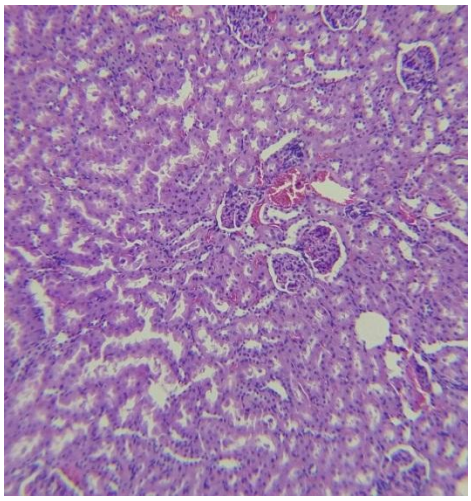


Histopathology of Kidney

Low Power Magnification 10X



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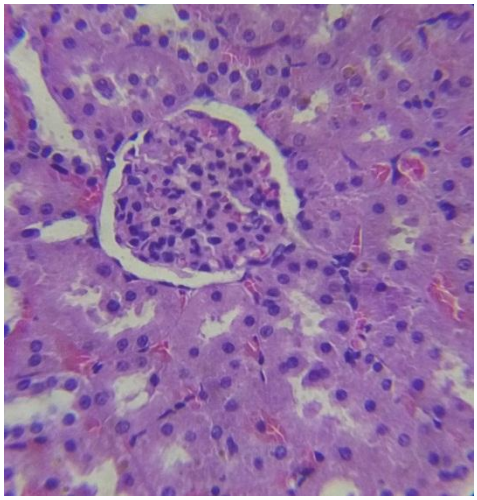

Histopathology of Spleen

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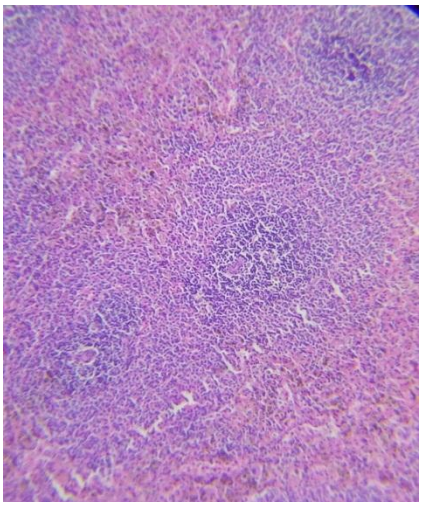

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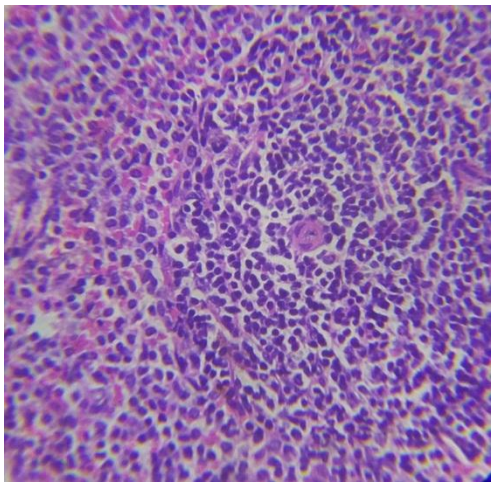
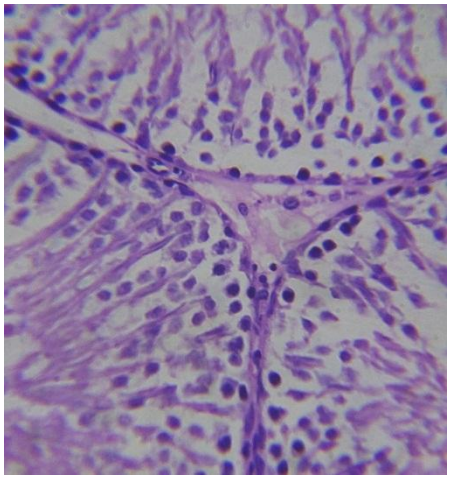


Histopathology of Testes

Low Power Magnification 10X

High Power Magnification 40X



Histopathology Analysis Report

Group ID: C1LMH

Brain

- No signs of pyknosis and perineural vacuolization
- No signs of edema or degeneration were observed.
- Arrangement of neurons on cerebral cortex appears normal and dense

Lung

- Perivascular region appears normal, Alveolar septa and wall appeared widen and normal
- No signs of lymphocyte cuffing

Heart

- Appearance of cardiomyocyte was normal with dark nuclear region. The nuclei of muscle fibers appear oval arrangement

Stomach

- Gastric glands, gastric glands including secretary sheath appears normal
- Normal gastric mucosa containing intact gastric gland cells, parietal cells which are spherical cell with deeply stained dark nucleus

Liver

- Centrilobular zone appears normal with stable network of hepatocytes
- The walls of the lumen appears normal with no evidence of ischemic changes .
- No evidence of infiltration

Kidney

- Variable tubular congestion were observed
- Proximal and distal convoluted tubule appears normal
- No signs of cellular necrosis

Spleen

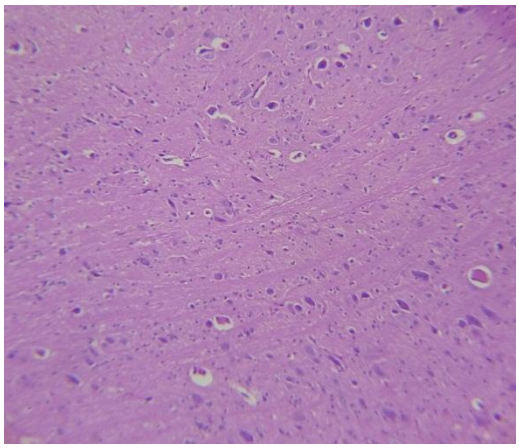
- Marginal sinus (MS) of the rat and its sinus lining cells appears normal
- Erythropoietic cells (EP) are scattered throughout the red pulp of both the samples. No abnormalities found in lymph node of both the samples

TESTES

- Appearance of leydig cells, interstitial tissue , seminiferous tubule, Sertoli cells and spermatogonia were normal
- No signs of interstitial fibrosis were observed
- Sperm oriented towards the center of sertoli cells with cluster of tail projected outside was observed

Histopathology of Brain

Low Power Magnification 10X



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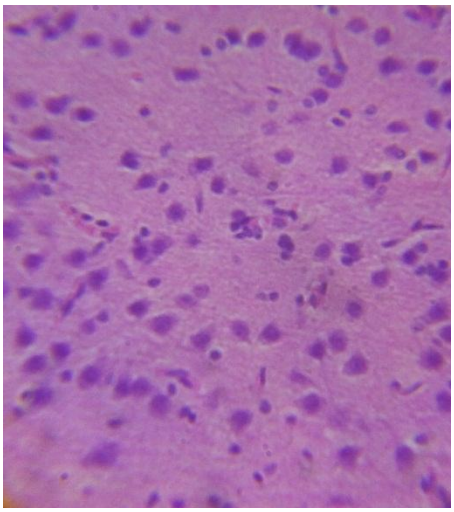
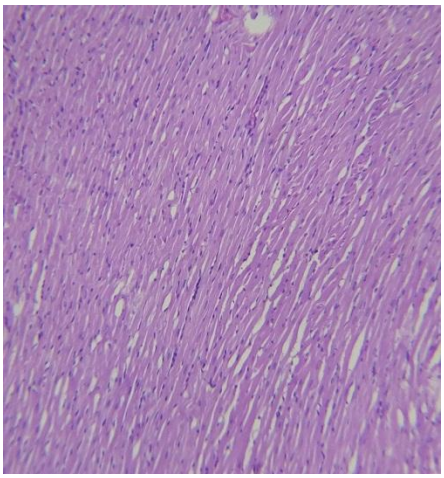


Histopathology of Heart

Low Power Magnification 10X



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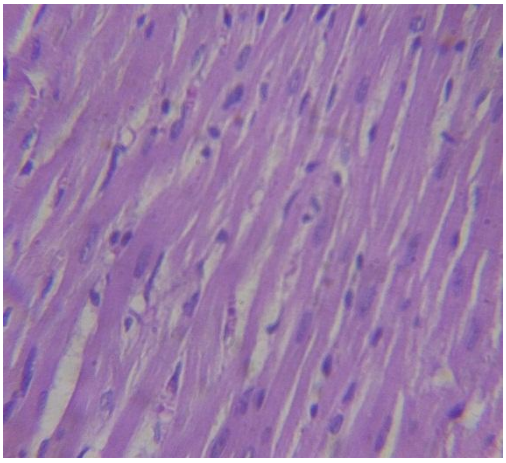
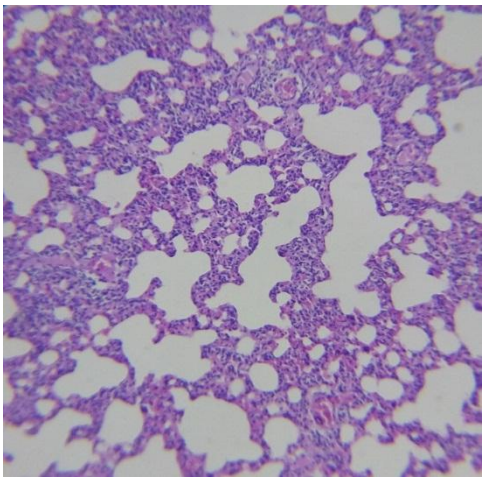


Histopathology of Lung

Low Power Magnification 10X



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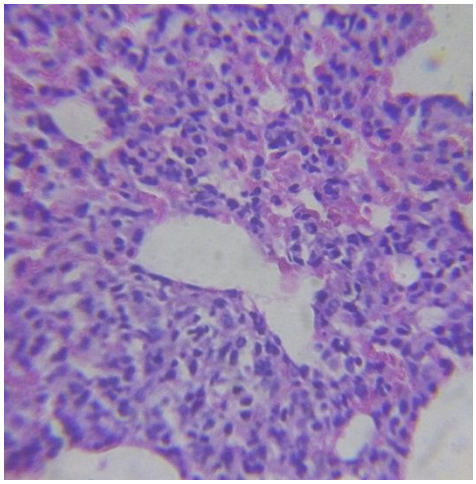

Histopathology of Stomach

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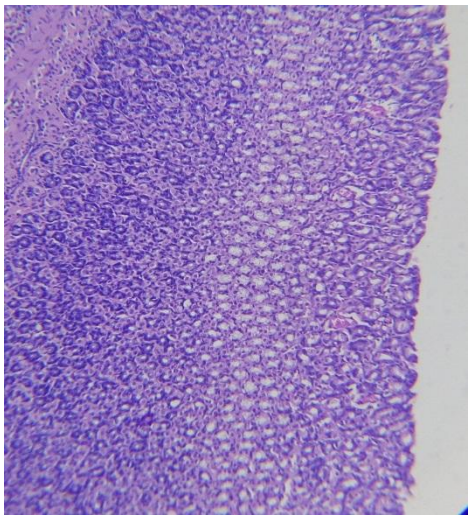

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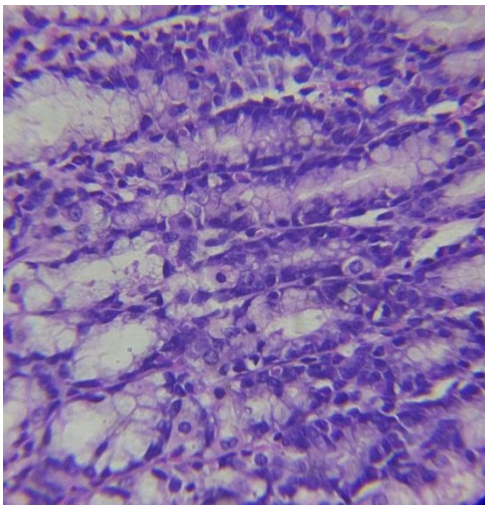

Histopathology of Liver

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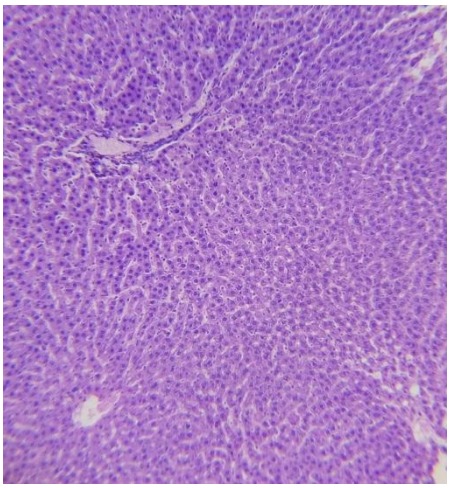

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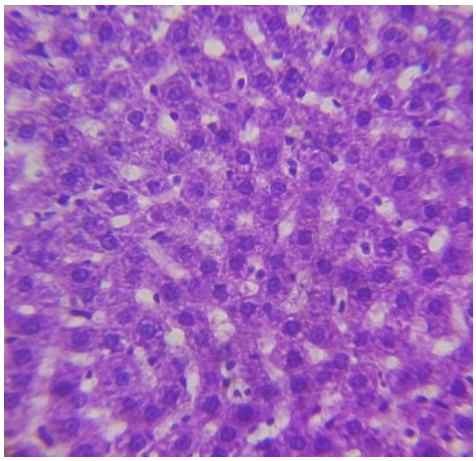

Histopathology of Kidney

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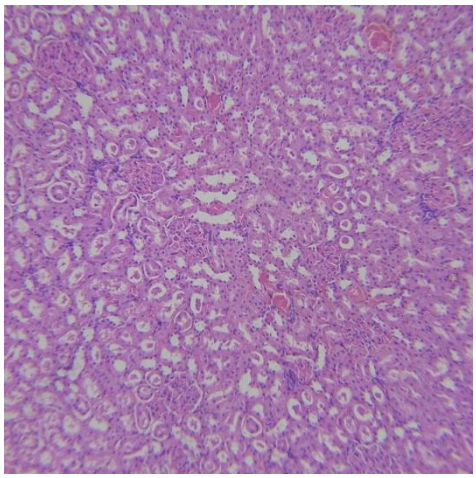

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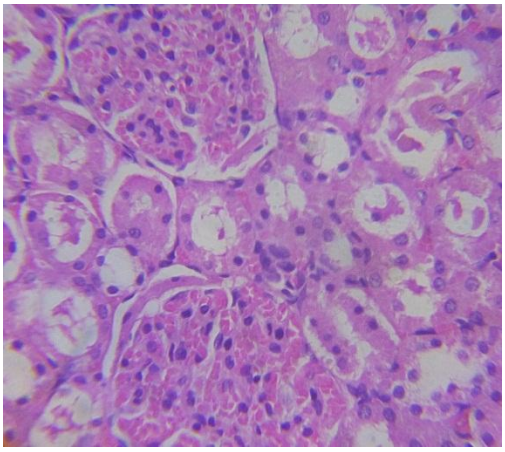
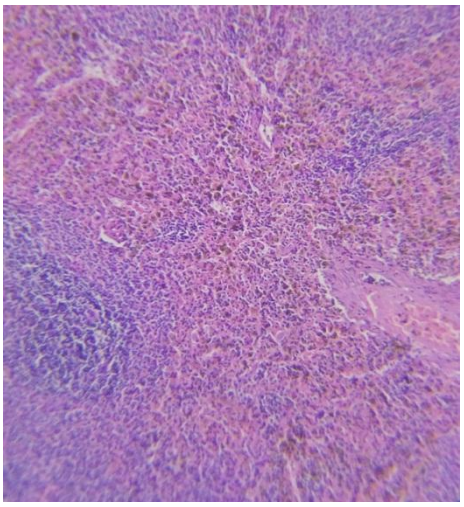


Histopathology of Spleen

Low Power Magnification 10X



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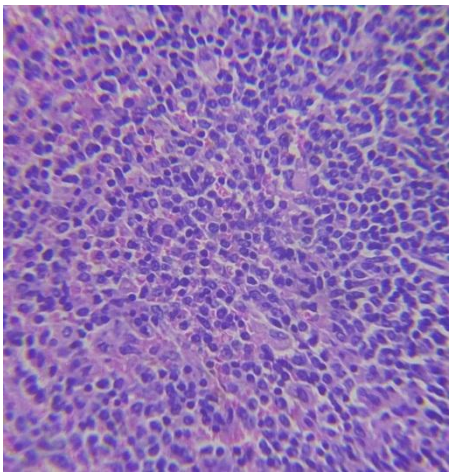
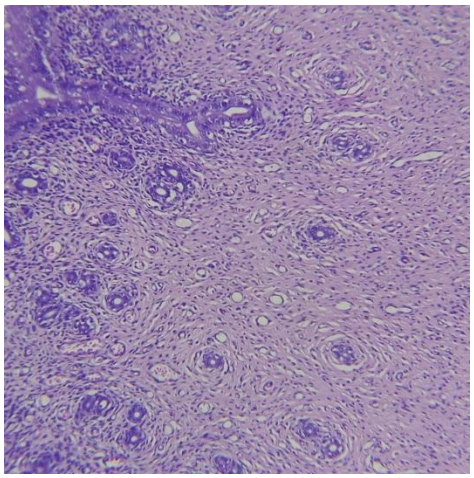


Histopathology of Uterus

Low Power Magnification 10X



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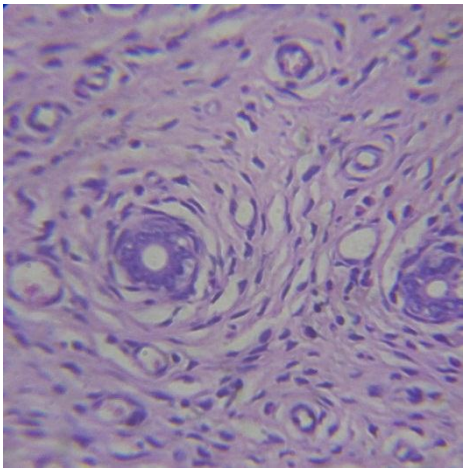
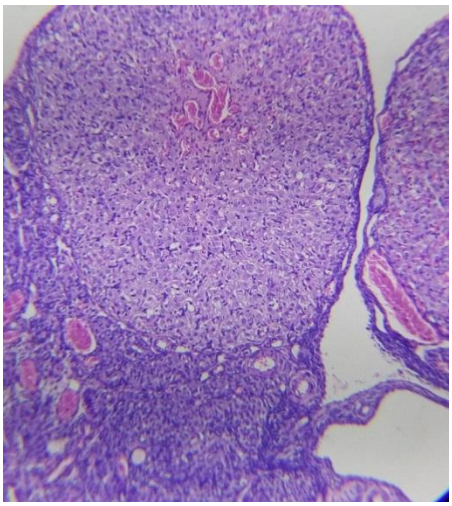


Histopathology of Ovary

Low Power Magnification 10X



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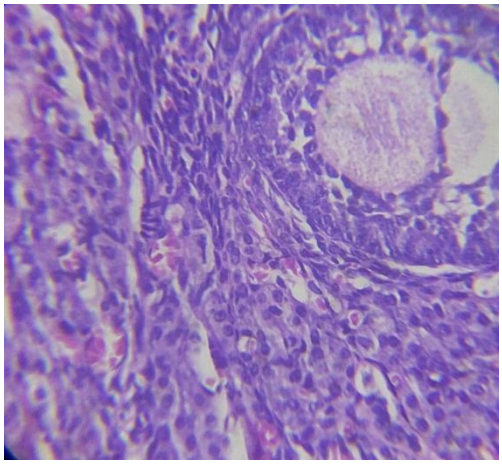


- **Histopathology Analysis Report**

Group ID: CMFH

Brain

- Arrangement of the neurons appears intact with no sings of degeneration or apoptotic changes in both the samples
- Cortex region showed normal neurons with polygonal to round cell bodies containing dense cytoplasm.

Lung

- No signs of airway secretion and bronchial secretion
- Bronchial blood vessels and connective tissue appears normal with no sings of pulmonary edema

Heart

- No evidence on accumulation of adipose tissue on interstitium
- No evidence of atherosclerosis and thrombosis

Stomach

- Gastric glands, gastric glands including secretary sheath appears normal
- Normal gastric mucosa containing intact gastric gland cells, parietal cells which are spherical cell with deeply stained dark nucleus

Spleen

- Lymphoid follicles appears normal
- Erythropoietic cells (EP) are scattered throughout the red pulp of both the samples.
- Appearance of LF – lymphoid follicle; PALS – periarterial lymphoid sheath was normal with no significant signs of enlargement

Liver

- The walls of the lumen appears normal with no evidence of ischemic changes .
- No evidence of infiltration
- Liver parenchyma appears normal with no evidence of necrosis

Kidney

- Swollen tubular basement membrane
- The lining epithelial cells of the renal tubules shown pyknosis of the nuclei

Uterus

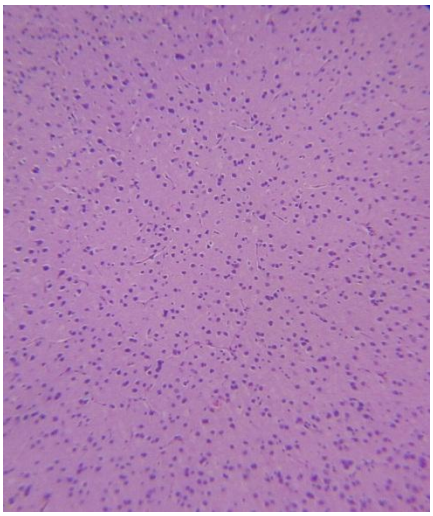
- Appearance of endometrium, myometrium and uterine glands was normal.
- Endometrial gland, epithelium and blood vessels appears normal

Ovary

- Histopathological analysis of ovary showing normal corpus luteum (CL) and Primordial follicles with few mature ovarian follicles with no signs of abnormality.

Histopathology of Brain

Low Power Magnification 10X



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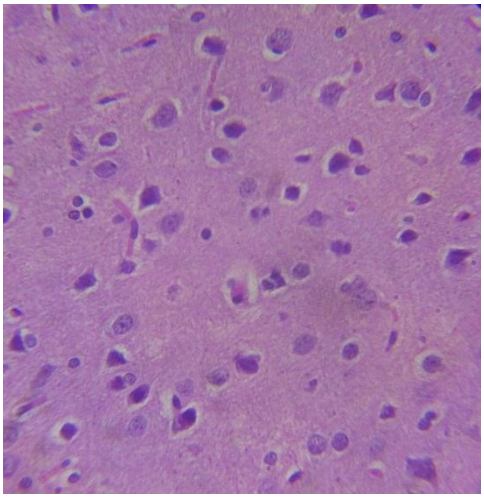
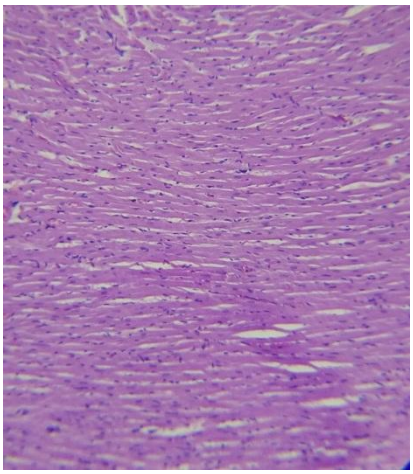


Histopathology of Heart

Low Power Magnification 10X



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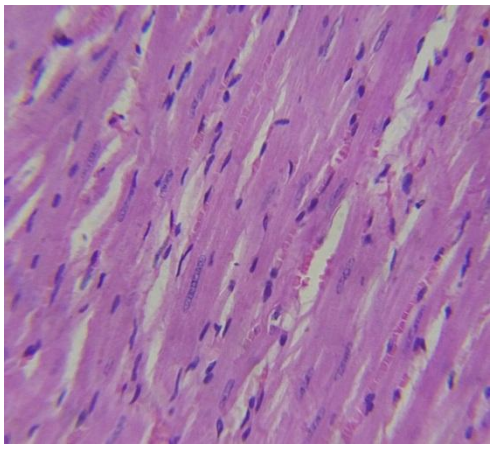
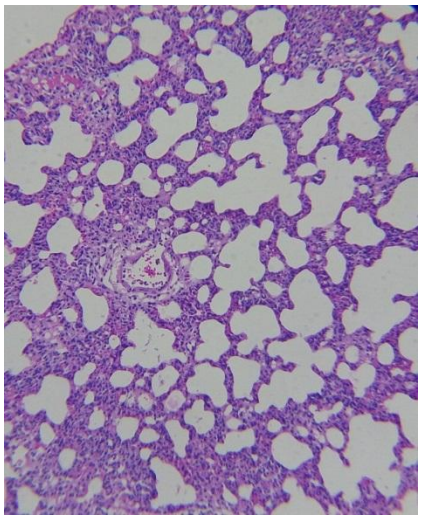


Histopathology of Lung

Low Power Magnification 10X



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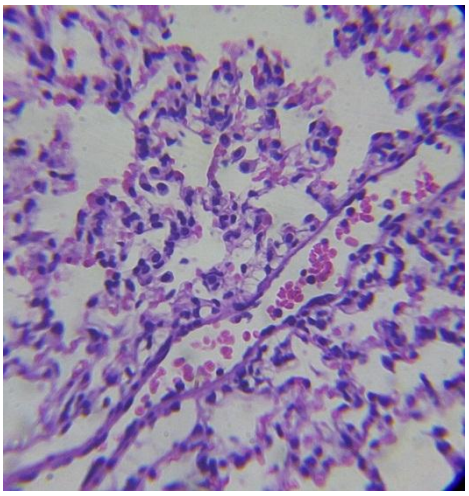
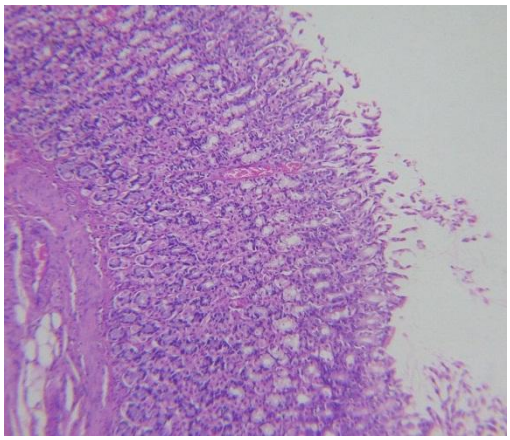


Histopathology of Stomach

Low Power Magnification 10X



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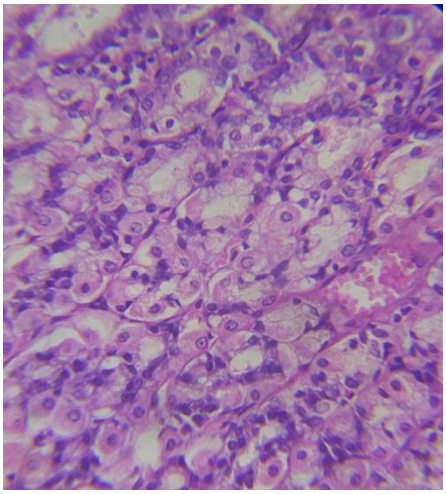
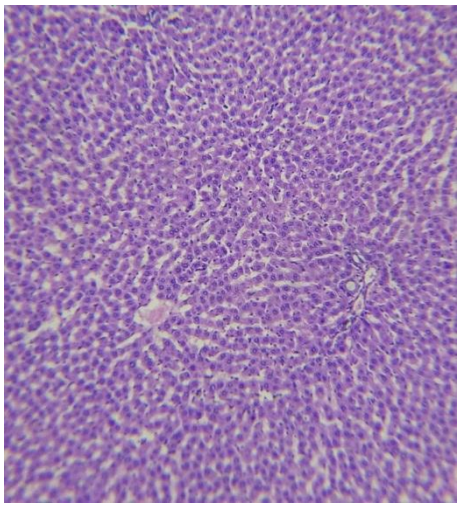


Histopathology of Liver

Low Power Magnification 10X



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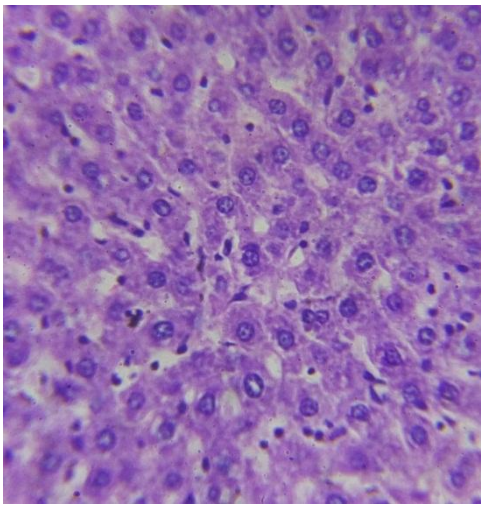
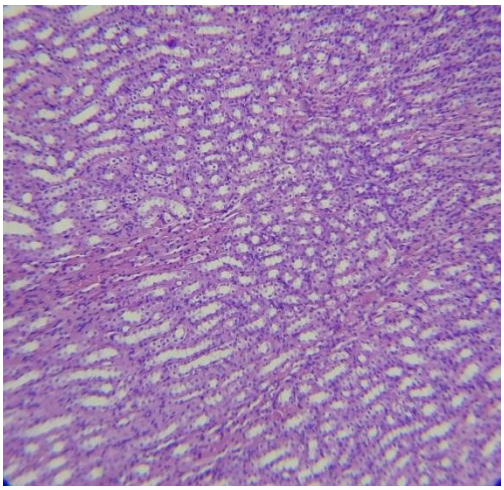


Histopathology of Kidney

Low Power Magnification 10X



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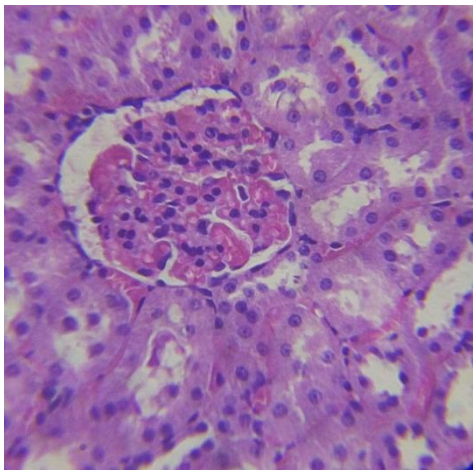
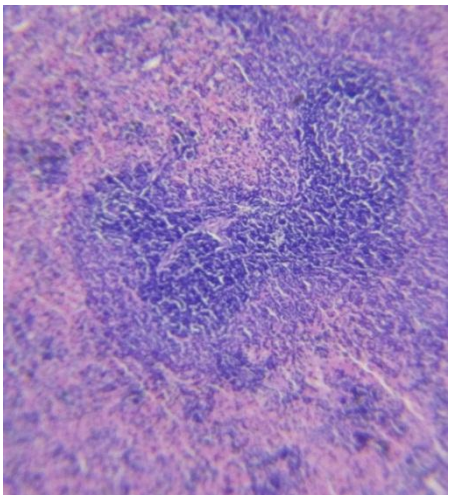
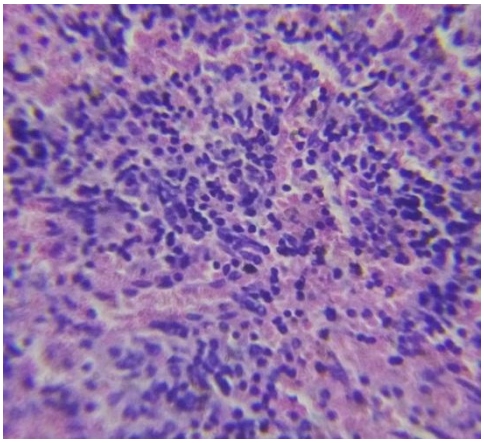


Histopathology of Spleen

Low Power Magnification 10X

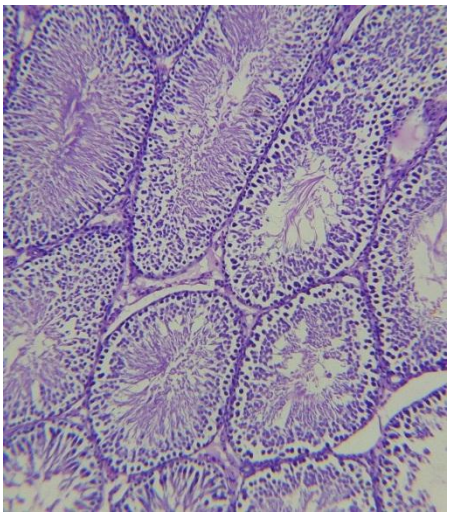


High Power Magnification 40X

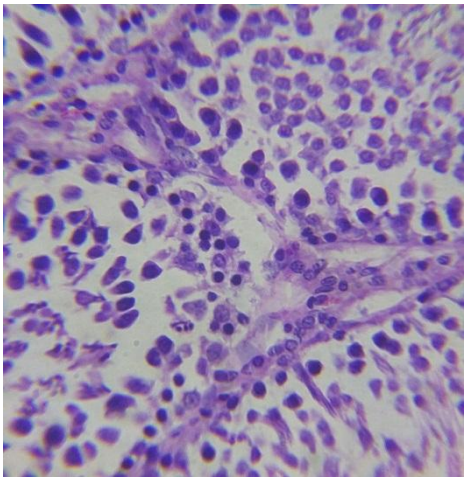


Histopathology of Testes

Low Power Magnification 10X



High Power Magnification 40X



Histopathology Analysis Report

Group ID: C1MMH

Brain

- No signs of pyknosis and perineural vacuolization
- No signs of edema or degeneration were observed.
- Arrangement of neurons on cerebral cortex appears normal and dense

Heart

- No evidence on accumulation of adipose tissue on interstitium
- No evidence of atherosclerosis and thrombosis

Lung

- Perivascular region appears normal, Alveolar septa and wall appeared widen and normal
- No signs of lymphocyte cuffing

Stomach

- Lumina of blood vessels appears normal. Appearance of glandular lumen was normal
- Intracytoplasmic zone of mucosa appears normal

Spleen

- Marginal sinus (MS) of the rat and its sinus lining cells appears normal
- Erythropoietic cells (EP) are scattered throughout the red pulp of both the samples. No abnormalities found in lymph node of both the samples

Liver

- Liver sinusoid appears widen with occasional bi nucleated hepatocytes
- Portal vein viewed normal with no evidence of inflammation

Kidney

- Mild evidence of tubular congestion were observed
- Swollen tubular basement membrane
- The lining epithelial cells of the renal tubules shown pyknosis of the nuclei

TESTES

- Appearance of leydig cells, interstitial tissue , seminiferous tubule, Sertoli cells and spermatogonia were normal
- No signs of interstitial fibrosis were observed
- Sperm oriented towards the center of sertoli cells with cluster of tail projected outside was observed

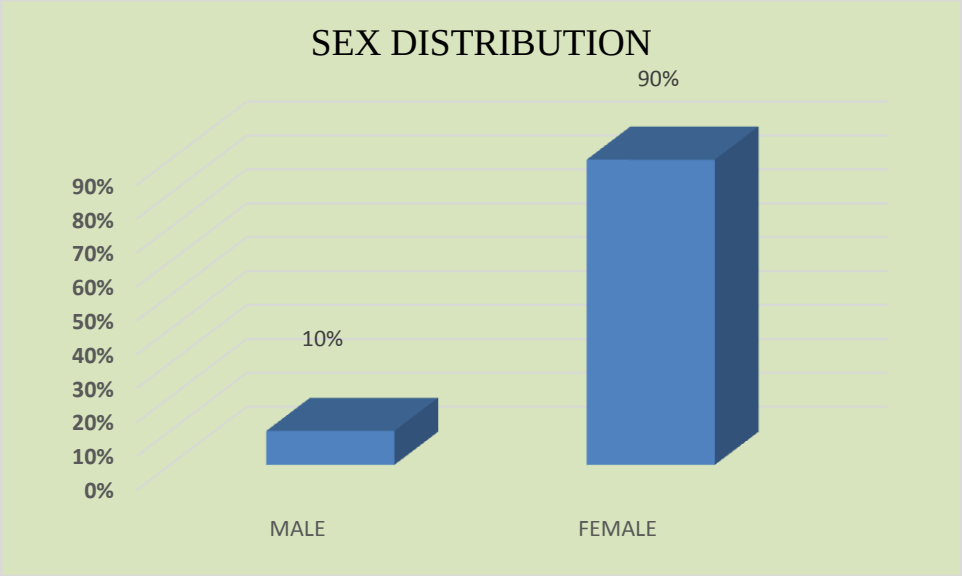
OBSERVATION AND RESULTS

Results of the study were observed with respect to the following criteria

1. Sex Distribution
2. Age Distribution
3. Socio-Economical Status
4. Occupational Distribution
5. Diet
6. Thinai
7. Paruva kaalam
8. Gunam
9. Body Constitution
10. Naadi
11. Distribution of Vali
12. Distribution of Azhal
13. Distribution of Iyam
14. Envagai thervugal
15. Neikkuri
16. Udhal thaathukkal
17. Kanmenthiriyam
18. Duration of illness
19. Mode of onset
20. Clinical features
21. Deformities
22. Involvementof Joints
23. Results

1. SEX DISTRIBUTION

Sl. No	Sex	No of Cases	Percentage
1	Male	4	10%
2	Female	36	90%

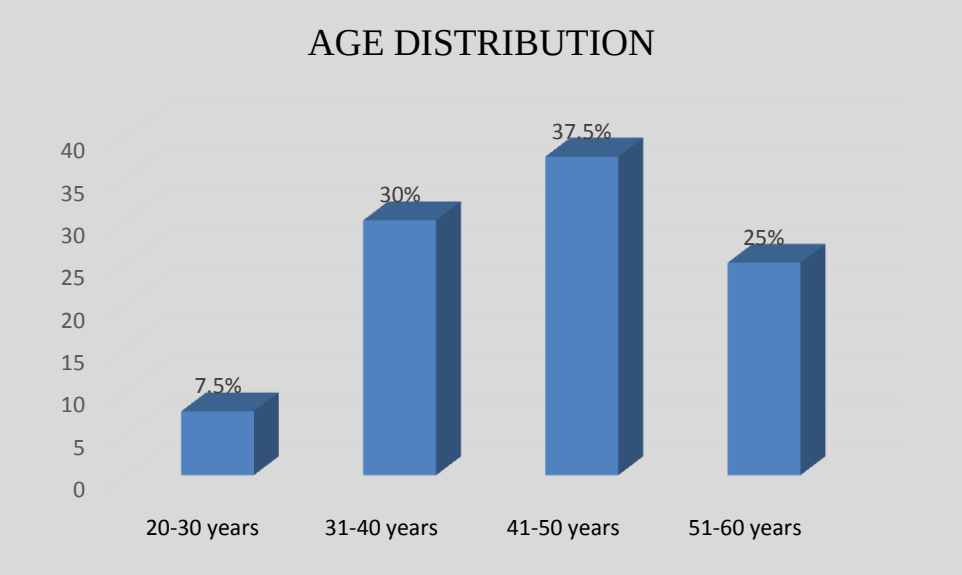


OBSERVATION

Among 40 patients selected, the disease was found to be in high in females (90%) and low in males (10%)

2. AGE DISTRIBUTION

Sl. No	Age	No of Cases	Percentage
1	20-30 years	3	7.5%
2	31-40 years	12	30%
3	41-50 years	15	37.5%
4	51-60 years	10	25%

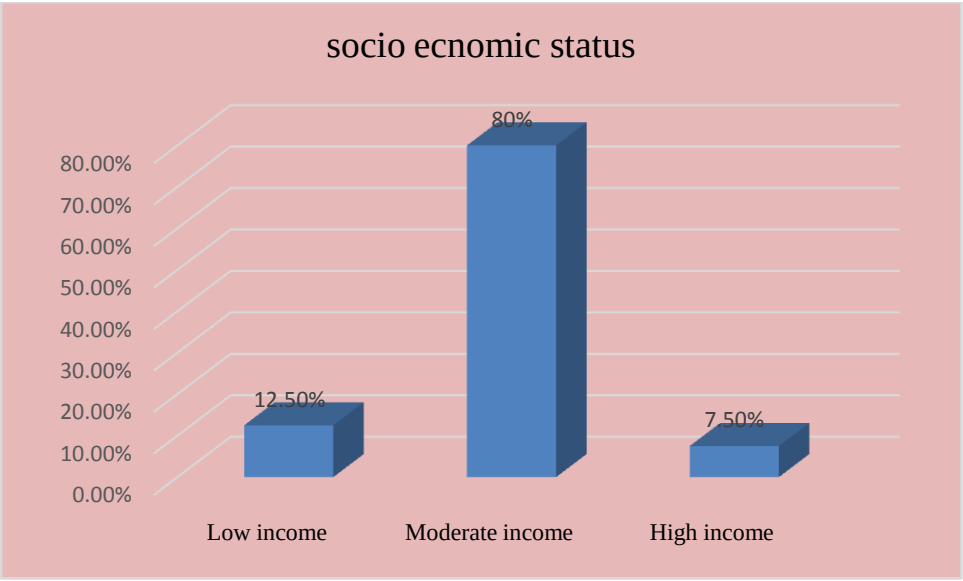


Observation:

7.5 % of patients came under the age group between 20-30 years, 30% of patients fell under the age group between 31-40 years, 37.5 % of patients were between 41-50 years and 40% of patients were between 51-60 years.

3. SOCIO ECONOMIC STATUS

Sl. No	Socio economic status	No of Cases	Percentage
1	Low income	5	12.5%
2	Moderate income	32	80%
3	High income	3	7.5%

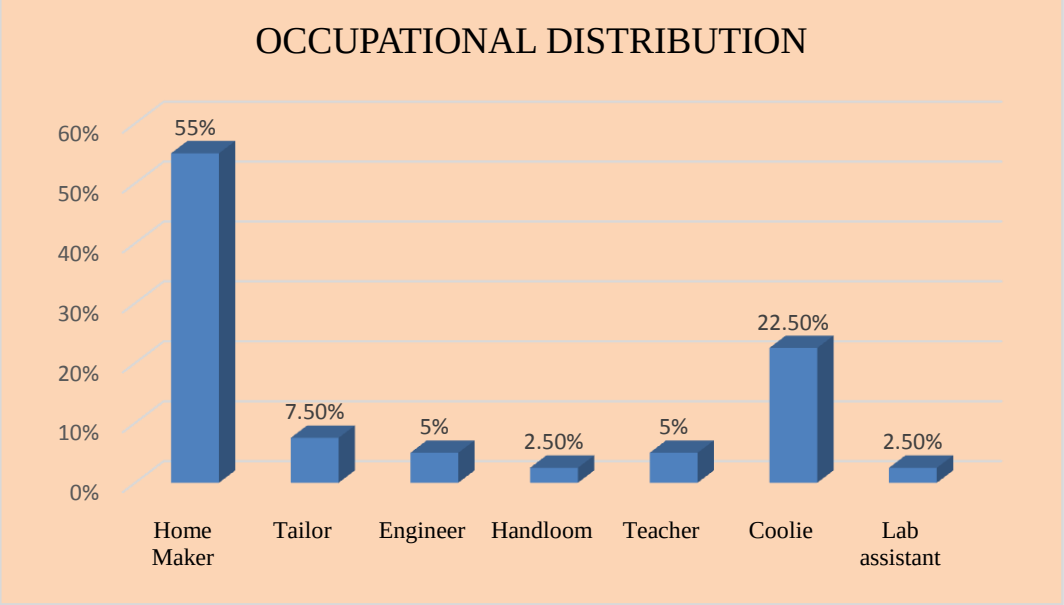


Observation:

In this study the disease were found high in moderate income group and low in high income group.

4. OCCUPATIONAL DISTRIBUTIONS

Sl. No	Nature of Work	No. of Cases	Percentage
1	Home Maker	22	55%
2	Tailor	3	7.5%
3	Engineer	2	5%
4	Handloom weavers	1	2.5%
5	Teacher	2	5%
6	Coolie	9	22.5%
7	Lab assistant	1	2.5%

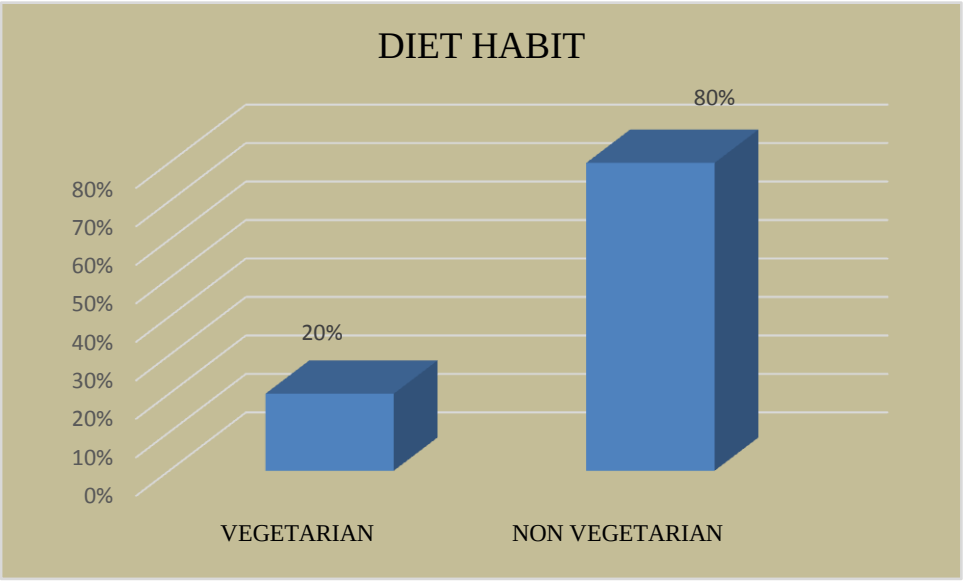


OBSERVATION:

Among 40 cases (55%) were home makers, (7.5%) were tailors, (2.5%) were handloom workers and lab assistant and (22.5%) of them were coolie

5. DIET

Sl. No	Dietary Habits	No of Cases	Percentage
1	Vegetarian	8	20%
2	Non Vegetarian	32	80%

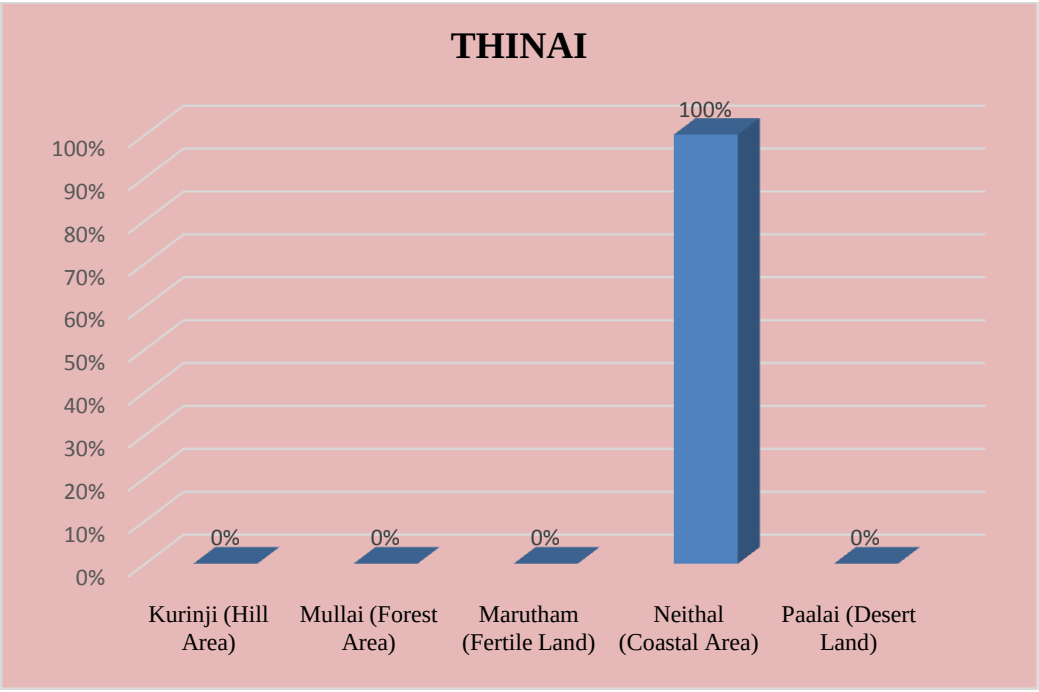


Observation :

Among 40 patients, 80% of patients were non vegetarian and 20% of patients were vegetarian.

6. THINAI

Sl. No	Thinai	No. of Cases	Percentage
1	Kurinji (Hill Area)	-	-
2	Mullai (Forest Area)	-	-
3	Marutham (Fertile Land)	-	-
4	Neithal (Coastal Area)	40	100%
5	Paalai (Desert Land)	-	-

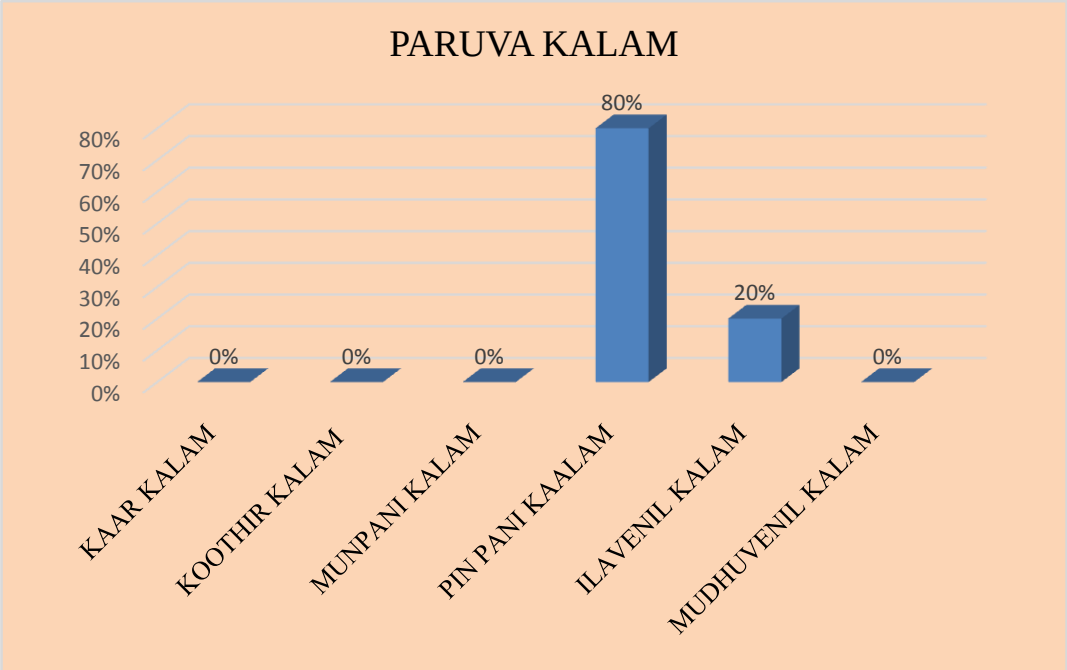


Observation:

Among the 40 cases all the cases were from Neithal thinai.

7. PARUVA KAALAM

S.no	Kaalam	No of cases	Percentage
1	Kaarkaalam	-	-
2	Koothirkaalam	-	-
3	Munpanikaalam	-	-
4	Pinpanikaalam	32	80%
5	Ilavenilkaalam	8	20%
6	Muthuvenilkaalam	-	-

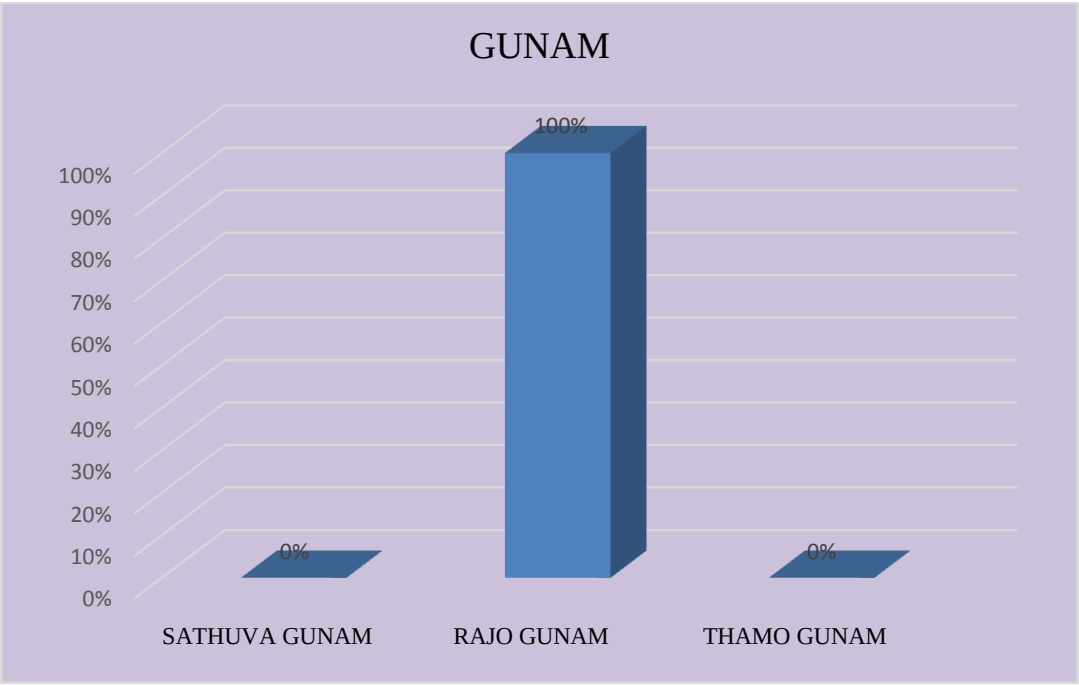


Observation:

Out of 40 cases 80% of the cases were treated in Pinpani kaalam and20% of them were treated in Ilavenil kaalam.

8. GUNAM

S.no	Gunam	No of cases	Percentage
1	Sathuvagunam	-	-
2	Rasogunam	40	100%
3	Thamogunam	-	-

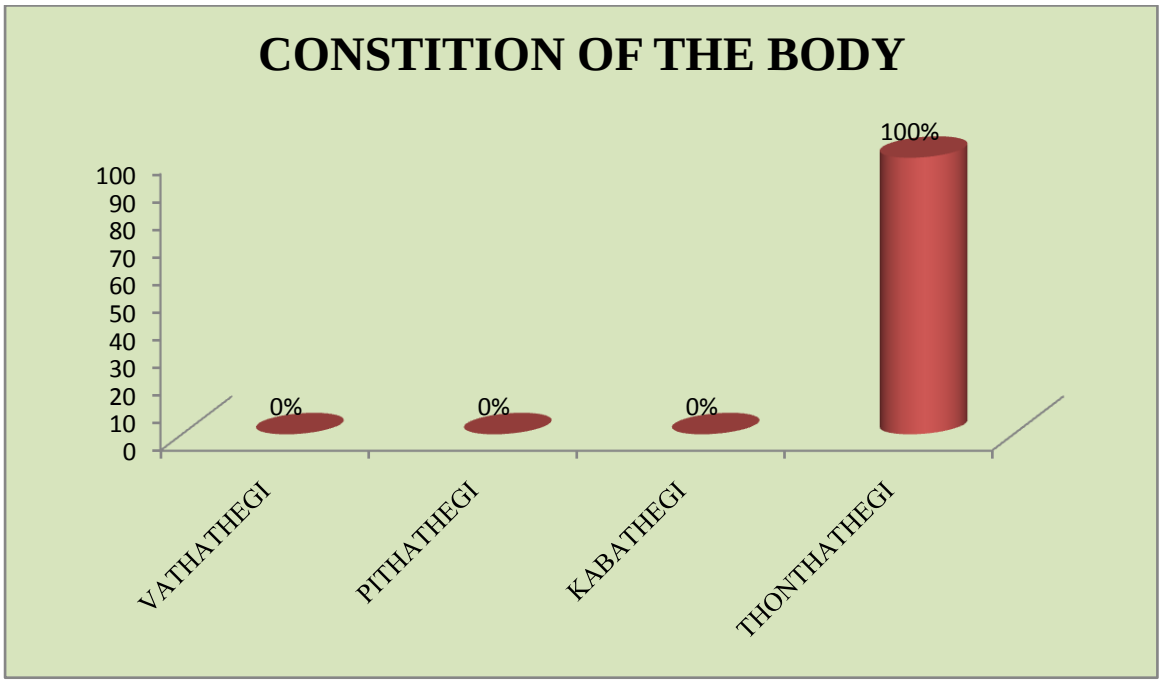


OBSERVATION:

In Gunam 100% of cases had Rasogunam.

9. YAAKAI ILAKKANAM (BODY CONSTITUTION)

S.no	Yaakaiilak kanam	No of cases	Percentage
1	Vaathathegi	-	-
2	Pithathegi	-	-
3	Kabathegi	-	-
4	Thonthathegi	40	100%

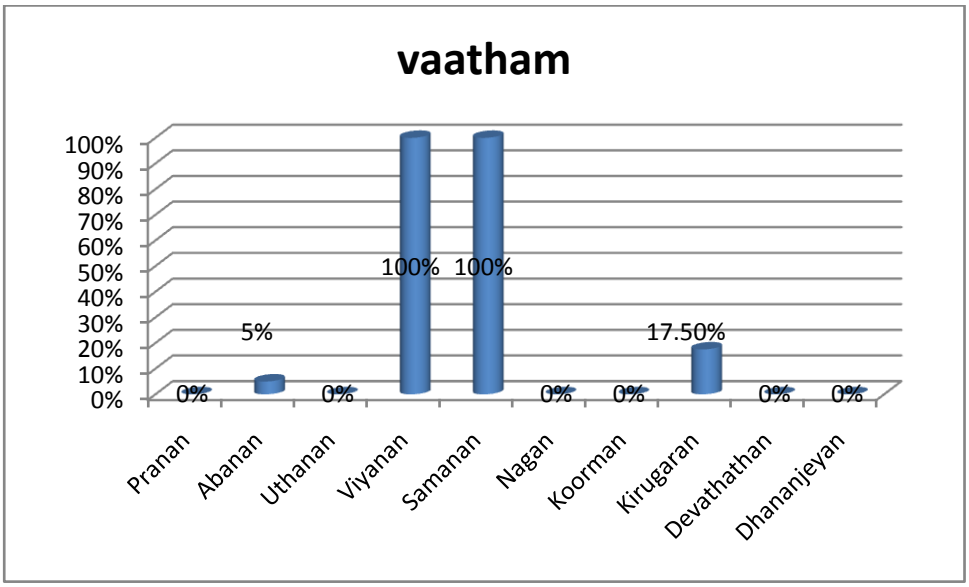


Observation

Out of 40 cases, all the cases were under Thonthaudal.

10. DISTURBANCE OF VAATHAM

S.no	Vaatham	No of cases	Percentage
1	Pranan	-	-
2	Abanan	2	5%
3	Uthanan	-	-
4	Viyanan	40	100%
5	Samanan	40	100%
6	Nagan	-	-
7	Koorman	-	-
8	Kirugaran	7	17.5%
9	Devathathan	-	-
10	Dhananjeyan	-	-

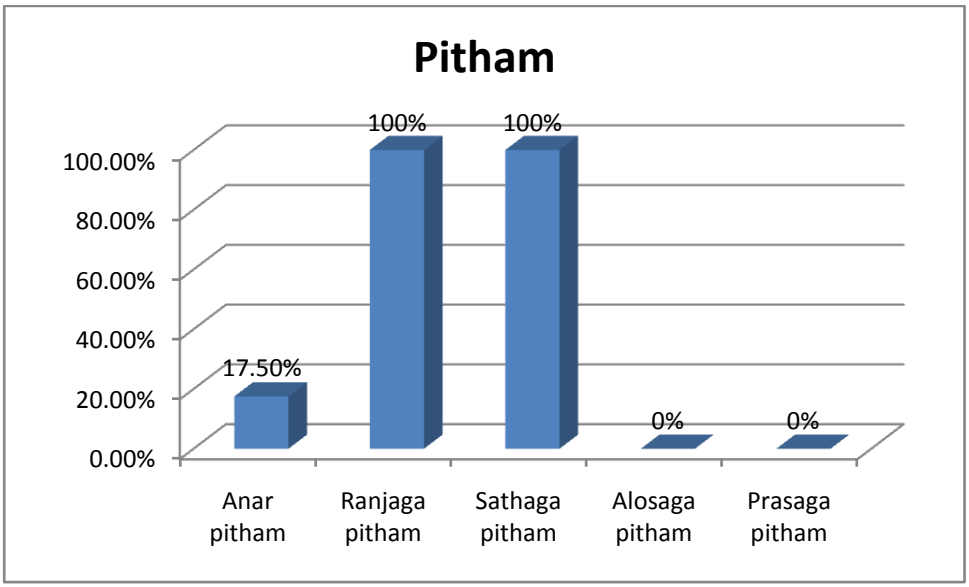


OBERVATION:

In Vaatham, Viyaanan and Samanan were affected in all 40 cases (100%), Abaanan was affected in 5% of cases and kirukaran was affected in 17.5% cases

11. DISTURBANCE OFAZHAL:

S.no	Pitham	No of cases	Percentage
1	Anarpitham	7	17.5%
2	Ranjagapitham	40	100%
3	Sathagapitham	40	100%
4	Alosagapitham	-	-
5	Prasagapitham	-	-

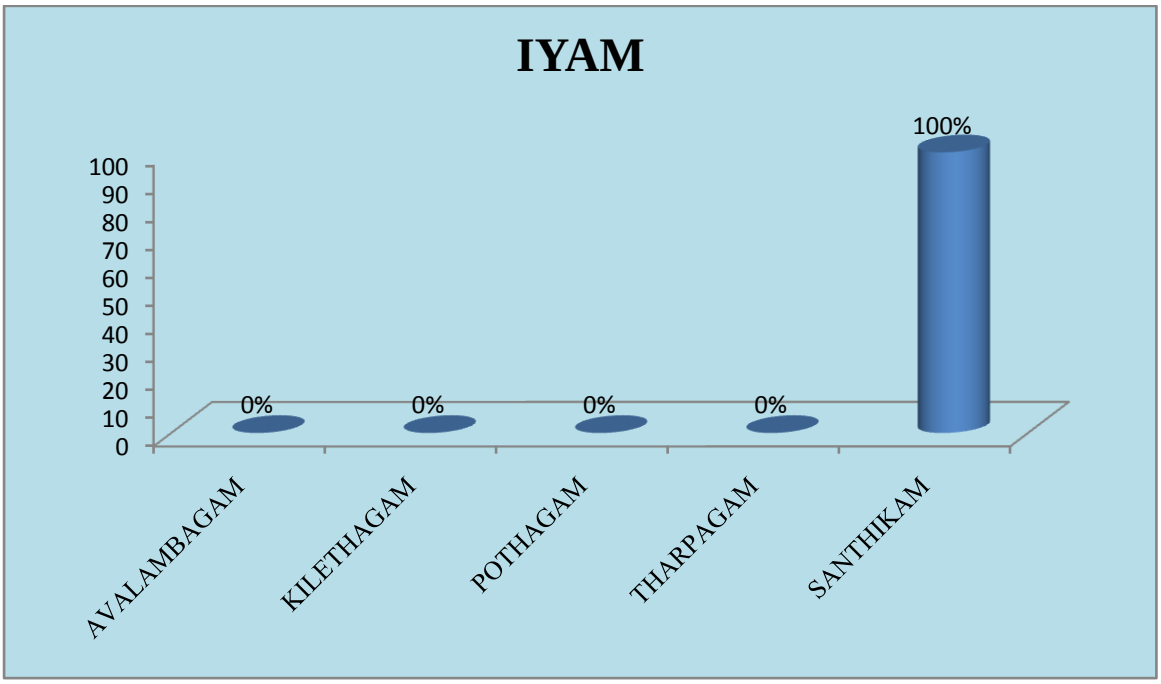


OBSERVATION:

In Pitham, Anar pitham was affected in (17.5%) of cases, Ranjagapitham was affected in (100%) Saathagam was affected in 40 (100%) cases.

12. DISTURBANCE OF IYAM

S.no	Iyam	No of cases	Percentage
1	Avalambagam	-	-
2	Kilethagam	-	-
3	Pothagam	-	-
4	Tharpagam	-	-
5	Santhigam	40	100%



Observation:

In Iyam, santhigam was affected in all cases(100%).

13. ENVAGAI THERVUGAL:

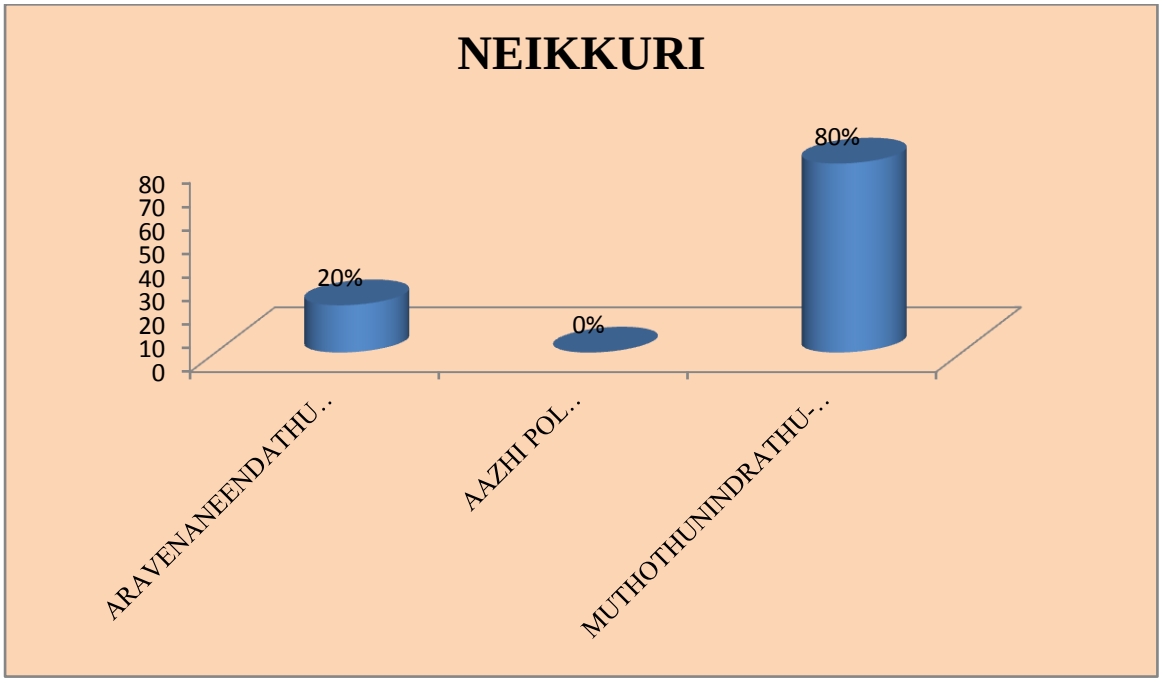
Sl. No	EnvagaiThervugal	No. of Cases	Percentage
1	Naadi		
	a. Vathapiththam	20	50%
	b. Piththavatham	10	25%
	c. Kabavatham	4	10%
	d. Kabapiththam	6	15%
2	Sparisam	40	100%
3	Naa	-	-
4	Niram	-	-
5	Mozhi	-	-
6	Vizhi	-	-
7	Malam	2	5%
8	Moothiram	-	-

Observation:

In Envagaithervugal, Niram and Sparisam were found affected in all the 40 cases. The Naadinadai seen in Vali Azhal Keel Vaayu patients were Vathapitham 50%, Pithavatham 25 %, Kabavatham 10% and Kabapitham15%.

14. NEIKKURI

S.no	Neikuri	No of cases	Percentage
1	Vaathaneer (Aravenaneendathu)	8	20%
2	Pithaneer (Aazhipolparaviyathu)	-	-
3	Kabaneer (Muthothuninrathu)	32	80%
4	Others	-	-

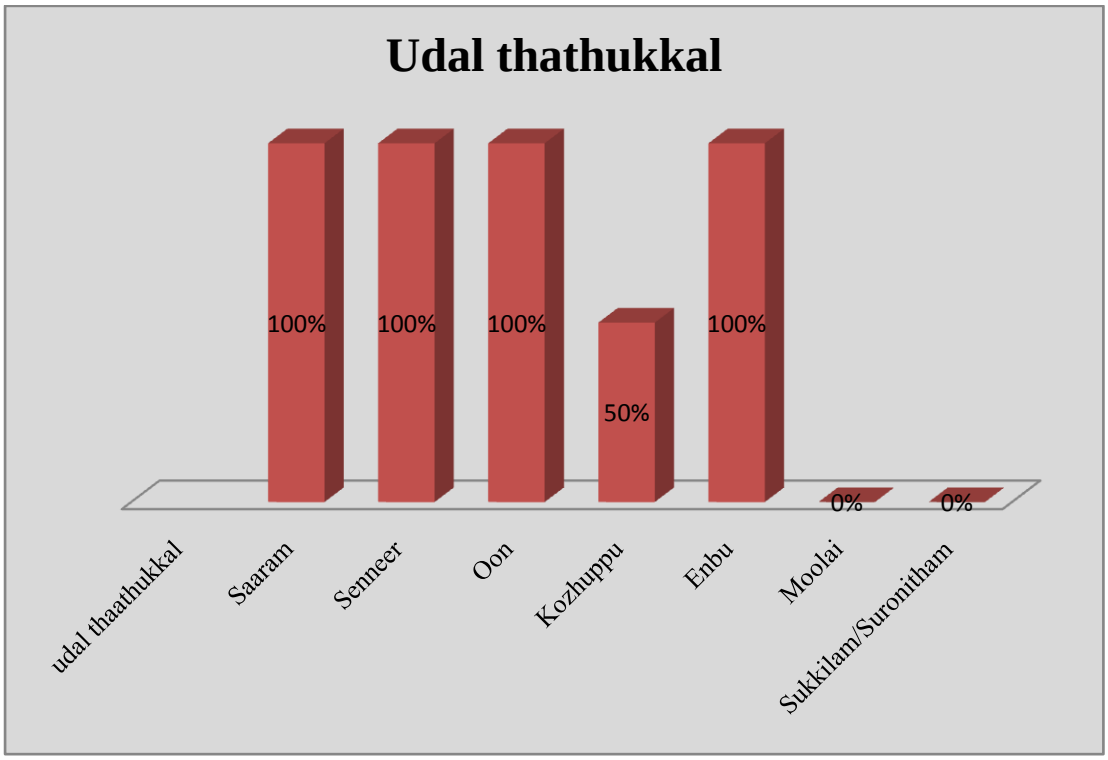


Obsevation:

Among 40 cases, Vaatha neer was found in 8 cases (20%) and Kaba neer was found in 32 cases (80%).

15. UDAL THAATHUKKAL

S.no	Udalthaathukkal	No of cases	Percentage
1	Saaram	40	100%
2	Senneer	40	100%
3	Oon	40	100%
4	Kozhuppu	20	50%
5	Enbu	40	100%
6	Moolai	-	-
7	Sukkilam/Suronitham	-	-

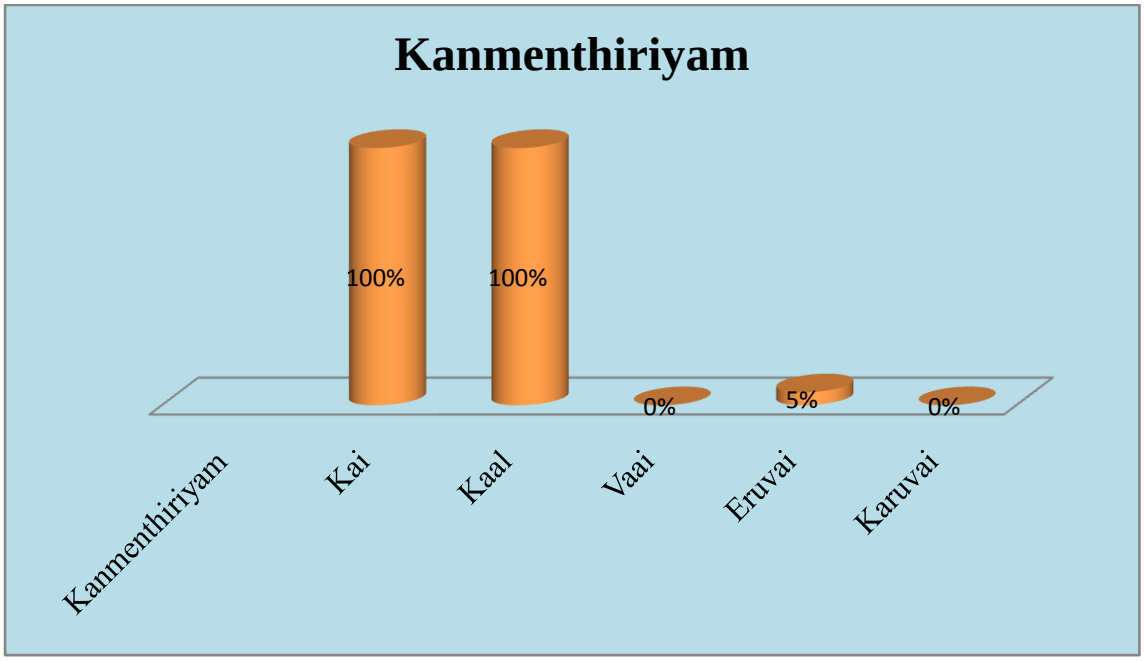


Observation

In this study Saaram, Senneer, Oon and Enbu were affected in all 40cases (100%). Kozhuppu was affected in 20 cases (50%)

16. KANMENTHIRIYAM

S.no	Kanmenthiriyam	No of cases	Percentage
1	Kai	40	100%
2	Kaal	40	100%
3	Vaai	-	-
4	Eruvai	2	5%
5	Karuvai	-	-

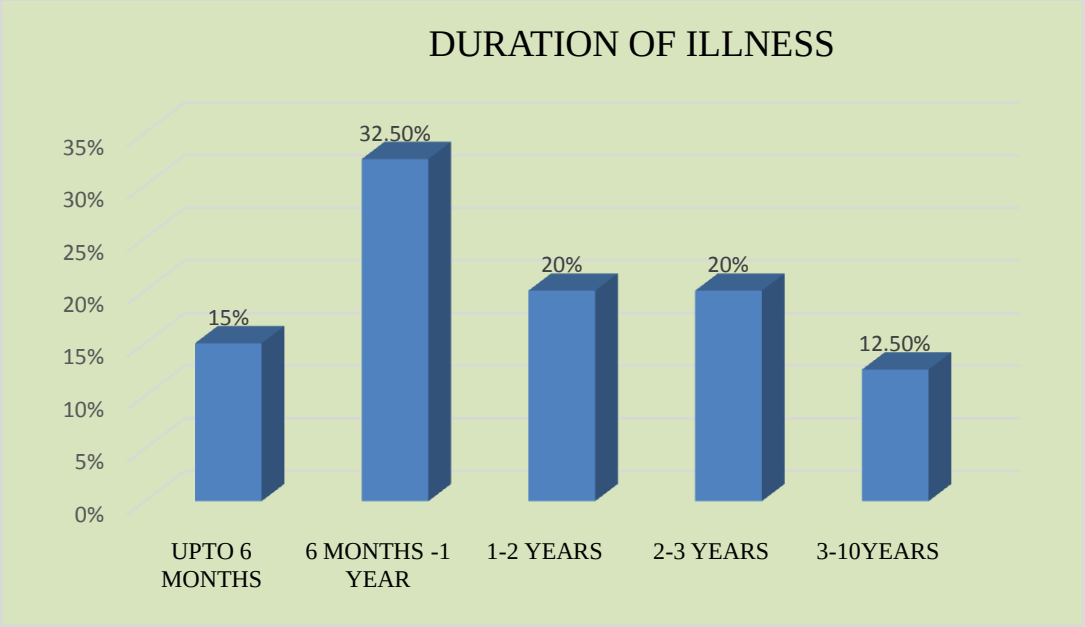


Observation:

In Kanmendrium, Kai and Kaal were affected in all 40 cases (100%), Eruvai affected in 2 cases (5%).

17. DURATION OF ILLNESS

S.no	Duration of illness	No of cases	Percentage
1	Upto 6 months	6	15%
2	6 months – 1 year	13	32.5%
3	1-2 years	8	20%
4	2-3 years	8	20%
5	3-10 years	5	12.5%

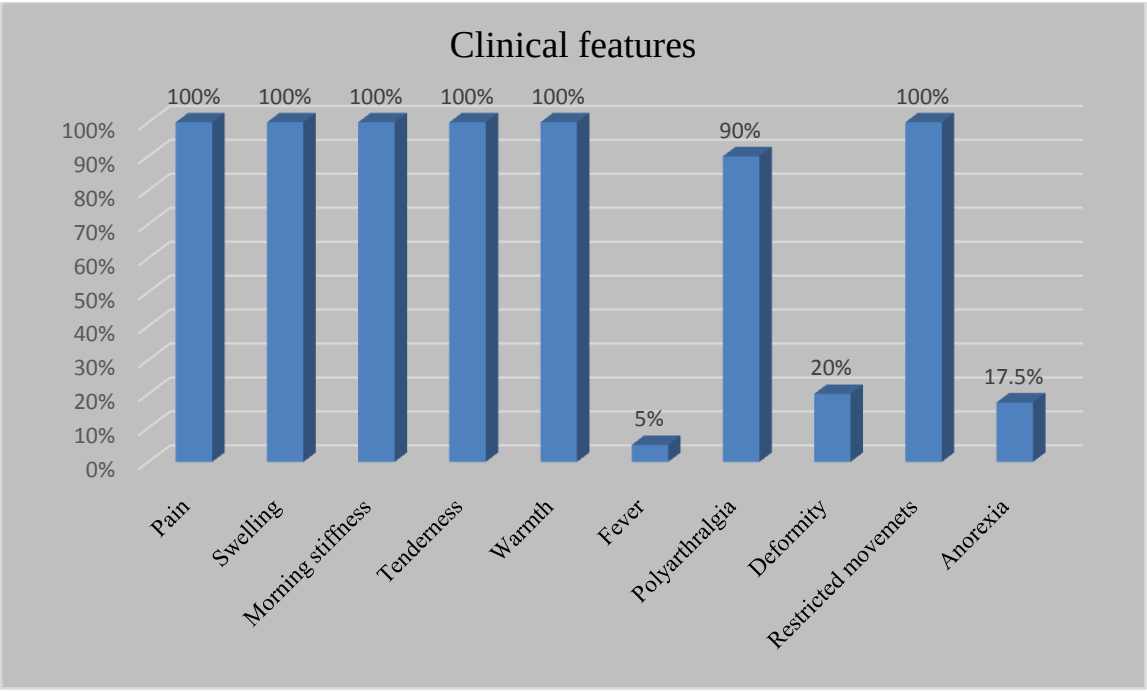


Observation:

In this study about 12.5%of cases had 3-10yrs of duration, 20% of cases had 2-3yrs of duration, 20% of cases had 1-2yrs of duration, 32.5% of cases had 6 months-1yr of duration and 15% cases had 6 month of Duration of illness.

18. CLINICAL FEATURES

S.no	Clinical features	No of cases	Percentage
1	Pain	40	100%
2	Swelling	40	100%
3	Morning stiffness	40	100%
4	Tenderness	40	100%
5	Warmth	40	100%
6	Fever	2	5%
7	Poly arthralgia	36	90%
8	Deformity	8	20%
9	Restricted movement	40	100%
10	Anorexia	7	17.5%

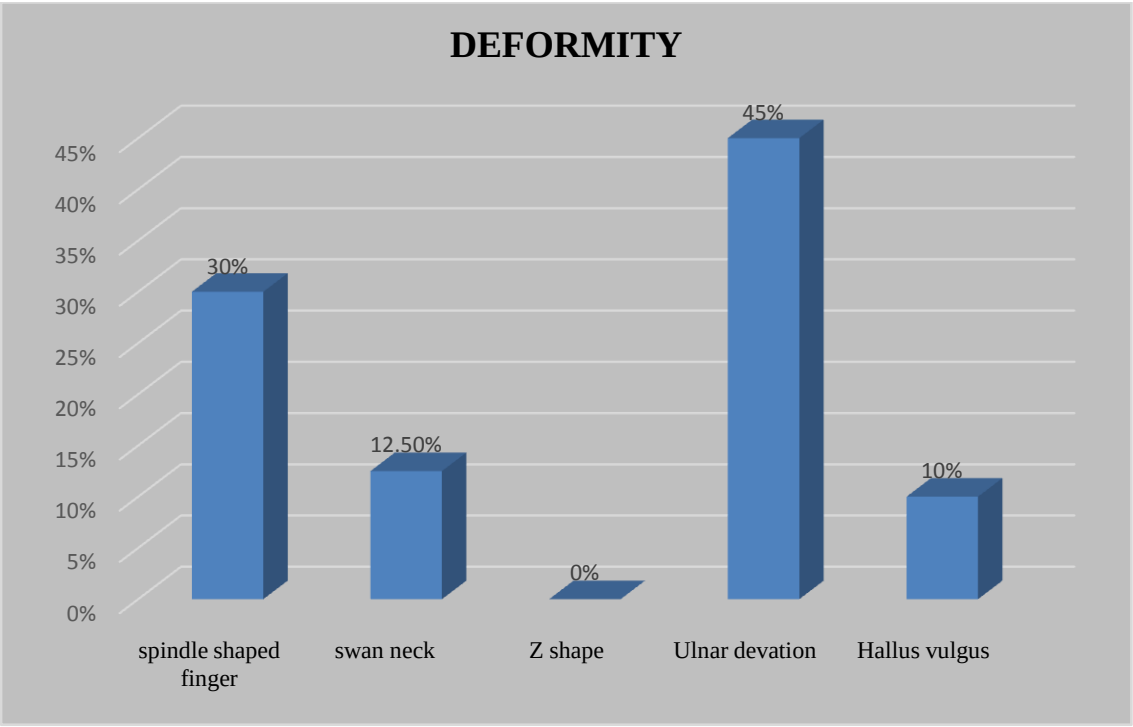


Observation:

In this study, all 100% of cases had Pain, Swelling, Early morning Stiffness, Warmth, Tenderness and Restricted Movements. 5% of cases had fever, 20% of cases had Deformities, 90% of cases had Polyarthralgia symptoms and 17.5% of cases had anorexia.

19. DEFORMITIES

S.no	Deformities	No of cases	Percentage
1	Spindle shaped fingers	12	30%
2	Swan neck deformity	5	12.5%
3	Z shape deformity	-	-
4	Ulnar deviation of hand	18	45%
5	Hallus vugus	4	10%

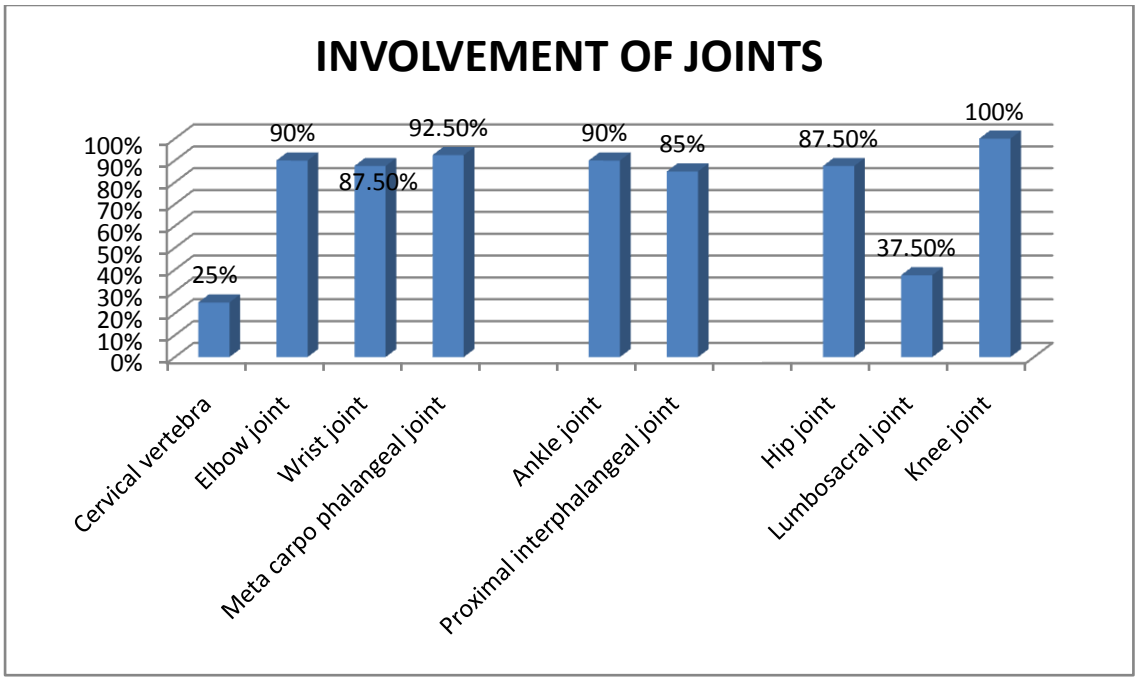


Observation:

In this study,30% of cases had Spindle shape deformity,12.5% cases had swanneck deformity,45% cases had ulnar deviation and 10% of cases had Hallus valgus deformity.

20. INVOLVEMENT OF JOINTS

S.no	Name of the joint	No of cases	Percentage
1	Cervical vertebra	10	25%
2	Elbow joint	36	90%
3	Wrist joint	35	87.5%
4	Metacarpo phalangeal joint (MCP)	37	92.5%
5	Ankle joint	36	90%
6	Proximal interphalangeal joint (PIP)	34	85%
7	Hip joint	35	87.5%
8	Lumbosacral joint	15	37.50%
9	Knee joint	40	100%



Observation:

In this study, MCP joints was involved in 37 cases (92.5%), Knee joint was affected in 100%, Elbow joints were involved in 36 cases (90%) Wrist and hip joints was involved in 35 cases (87.5%), Ankle joint was involved in 36 cases (90%), Lumbosacral joint was involved in 15 cases (37.5%),PIP were affected in 34(85%) casesand Cervical vertebra wasinvolved in 10 cases (25%).

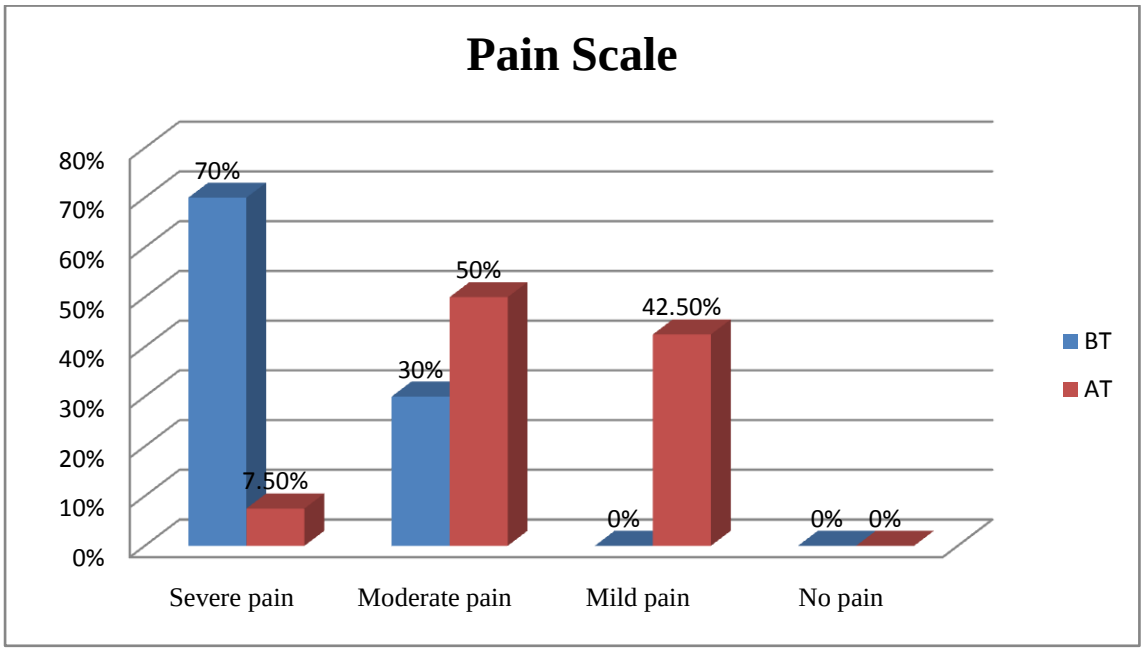
21a. PAIN SCORE BEFORE AND AFTER TREATMENT:

S.No	OP No	NAME	AGE/ SEX	PAIN SCORE		RESULTS
				BT	AT	
1.	H42039	MrsKaliselvi	48/F	8	6	Moderate
2.	H62467	Manjula	38/F	8	2	Good
3.	I57192	Malliga.C	49/F	8	6	Moderate
4.	8729	Arunadevi.G	48/F	9	4	Moderate
5.	D069124	Mumtaj	60/F	7	2	Good
6.	H7004	V.Amsa	33/F	8	2	Good
7.	I56347	Balaraman	47/M	9	5	Moderate
8.	I42435	Mercy Vasantha	60/F	8	4	Moderate
9.	E04908	Nageahwari	43/F	9	7	Mild
10.	H94125	V. Shanthi	48/F	7	3	Good
11.	9471	Ganeshan. R	41/M	8	2	Good
12.	I85728	Muthulakshmi	35/F	7	3	Good
13.	H44555	Malarkodi	55/F	7	4	Moderate
14.	8720	Rani	58/F	10	6	Moderate
15.	H57980	S. Malliga	50/F	9	6	Moderate
16.	I73714	Uma	35/F	9	4	Moderate
17.	H41678	V.Laxshmi	55/F	7	3	Good
18.	I73585	Magi	31/F	8	5	Moderate
19.	8805	Ezhilmathi	37/F	9	4	Moderate
20.	I72305	Sundararaani	59/F	7	2	Good

S.No	OP No	NAME	AGE/ SEX	PAIN SCORE		Results
				BT	AT	
21.	9487	Munusamy.s	46/M	8	4	Moderate
22.	I52066	A bhuveneeshwari	37/F	8	3	Good
23.	H74965	Sangeetha	52/F	9	7	Mild
24.	F44328	Chandra.k	48/F	7	3	Good
25.	H17075	Panjavarnam	44/F	7	2	Good
26.	I45702	M. Anand	27/M	8	3	Good
27.	8842	Vanitha.m	29/F	9	6	Moderate
28.	9521	C.munusaamy	58/M	9	8	Mild
29.	H36596	P.usha	46/F	8	4	Moderate
30.	I02495	S.jayanthi	34/F	8	4	Moderate
31.	G45724	Papaathi	58/F	8	3	Good
32.	I81587	Krithikaa	34/F	8	3	Good
33	I75623	S.selvi	35/F	7	4	Moderate
34.	8864	Kala	29/F	8	2	Good
35.	8868	C.shanthi	45/F	7	5	Moderate
36.	8873	Shagunthala	45/F	7	1	Good
37.	G97925	Dhanakodi	59/F	8	5	Moderate
38.	8908	Vasantha	55/F	8	2	Good
39.	8911	Indhra	41/F	8	4	Moderate
40	I68500	R.selvi	37/F	8	5	Moderate

21b. PAIN SCORE BEFORE AND AFTER TREATMENT

S.no	Pain Scale	Before treatment		After treatment	
		No of cases	Percentage	No of cases	Percentage
1	Severe pain	28	70%	3	7.5%
2	Moderate pain	12	30%	20	50%
3	Mild pain	-	-	17	42.5%
4	No pain	-	-	-	-



Observation:

In this study, Before treatment, 28 cases (70%) had severe pain, remaining 12 cases (30%) had moderate pain. After treatment 3 cases (7.5%) had severe pain, 20 cases (50%) had Moderate pain and 17 cases (42.5%) had Mild pain.

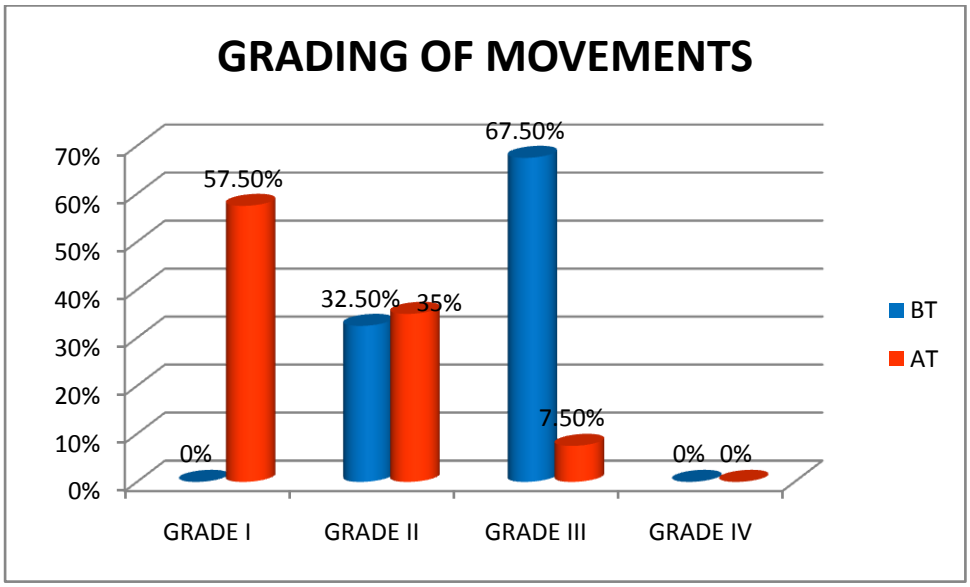
22. GRADING OF MOVEMENTS:

S.No	OP No	NAME	AGE/ SEX	GRADING OF MOVEMENTS	
				BT	AT
1.	H42039	KALISELVI	48/F	G3	G2
2.	H62467	MANJULA	38/F	G2	G1
3.	I57192	MALLIGA.C	49/F	G3	G2
4.	8729	ARUNADEVI.G	48/F	G3	G2
5.	D069124	MUMTAJ	60/F	G3	G1
6.	H7004	V.AMSA	33/F	G3	G1
7.	I56347	BALARAMAN	47/M	G3	G2
8.	I42435	MERCY VASANTHA	60/F	G3	G1
9.	E04908	NAGEAHWARI	43/F	G3	G2
10.	H94125	V. SHANTHI	48/F	G2	G1
11.	9471	GANESHAN. R	41/M	G3	G1
12.	I85728	MUTHULAKSHMI	35/F	G2	G1
13.	H44555	MALARKODI	55/F	G3	G1
14.	8720	RANI	58/F	G3	G2
15.	H57980	S. MALLIGA	50/F	G3	G2
16.	I73714	UMA	35/F	G3	G1
17.	H41678	V.LAXSHMI	55/F	G2	G1
18.	I73585	MAGI	31/F	G3	G2
19.	8805	EZHILMATHI	37/F	G3	G1
20.	I72305	SUNDARARAANI	59/F	G3	G1

S.No	OP No	NAME	AGE/ SEX	GRADING	
				BT	AT
21.	9487	MUNUSAMY.S	46/M	G3	G1
22.	I52066	BHUVENEESHWARI	37/f	G2	G2
23.	H74965	SANGEETHA	52/F	G3	G3
24.	F44328	CHANDRA.K	48/F	G2	G1
25.	H17075	PANJAVARNAM	44/F	G2	G2
26.	I45702	M. ANAND	27/M	G3	G1
27.	8842	VANITHA.M	29/F	G3	G1
28.	9521	C.MUNUSAAMY	58/m	G3	G3
29.	H36596	P.USHA	46/F	G2	G1
30.	I02495	S.JAYANTHI	34/F	G2	G1
31.	G45724	PAPAATHI	58/F	G3	G2
32.	I81587	KRITHIKAA	34/F	G2	G1
33	I75623	S.SELVI	35/F	G2	G1
34.	8864	KALA	29/F	G3	G2
35.	8868	C.SHANTHI	45/F	G2	G2
36.	8873	SHAGUNTHALA	45/F	G3	G1
37.	G97925	DHANAKODI	59/F	G3	G3
38.	8908	VASANTHA	55/F	G3	G1
39.	8911	INDHRA	41/F	G3	G2
40	I68500	R.SELVI	37/F	G2	G1

22a. GRADING OF MOVEMENTS:

Grade	Before treatment		After treatment	
	No. of patients	Percentage	No. of patients	Percentage
Grade I	0	0%	23	57.5%
Grade II	13	32.5%	14	35%
Grade III	27	67.5%	3	7.5%
Grade IV	0	0%	0	0%

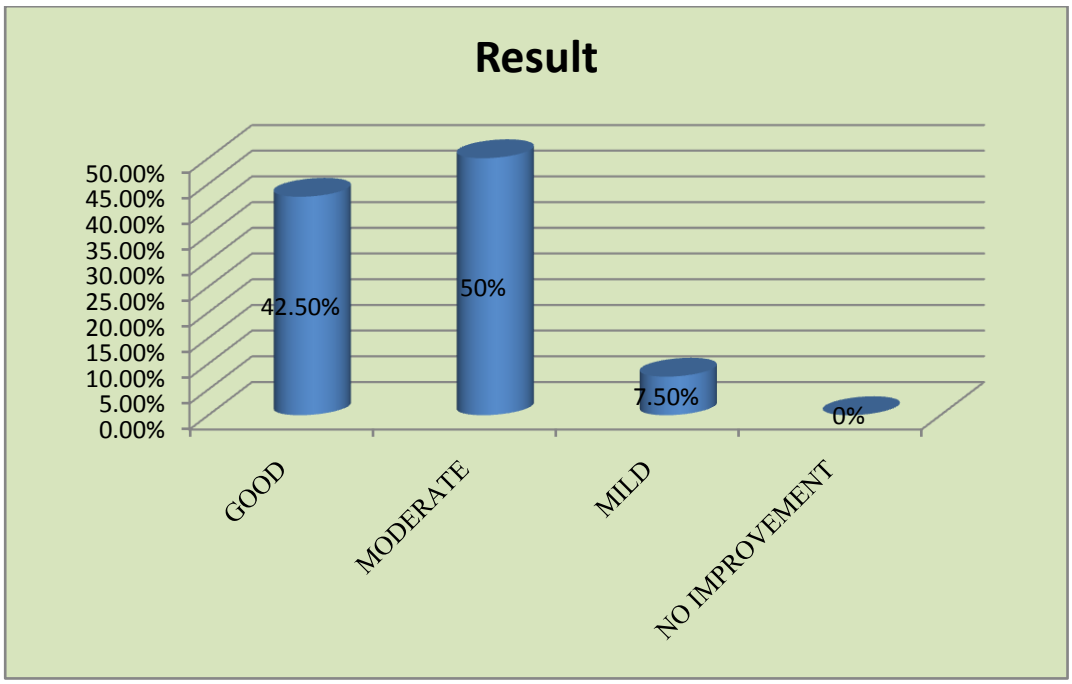


Observation:

In this study, Before treatment, 13 cases (32.5%) had mild restriction, 27 (67.5%) had moderate restriction, After treatment 23 (57.5%) cases were fit for all activities, 14 (35%) cases hadmoderate restriction.

23. Results

S.no	Results	No of cases	Percentage
1	Good Improvement	17	42.5%
2	Moderate Improvement	20	50%
3	Mild Improvement	3	7.5%
4	No Improvement	-	-



Observation:

In this study, 17 cases (42.5%) showed good improvement, 20 cases (50%) showed moderate improvement, 3 cases (7.5%) showed mild improvement.

LABORATORY INVESTIGATION OP AND IP- BEFORE AND AFTER TREATMENT

				Hb(gm/dl)		TOTAL RBC COUNT (million/cu.mm)		ESR (mm/hour)		TOTAL WBC COUNT	
S.NO	**IP/OP NO**	**NAME**	**AGE/ SEX**	**BT**	**AT**	**BT**	**AT**	**BT**	**AT**	**BT**	**AT**
1	H42039	KALISELVI	48/F	13.2	13.1	5.0	4.8	20	30	8100	7400
2	H62467	MANJULA	38/F	11.9	11.3	4.4	4.3	26	24	7,100	7,700
3	I57192	MALLIGA	49/F	11.8	11.3	4.4	4.6	30	24	6,500	7,000
4	8729	ARUNADEVI.G	48/F	13.5	11.4	5.3	4.8	24	44	9,300	9,200
5	D069124	MUMTAJ	60/F	11.8	12.1	4.4	4.4	34	24	6,300	5,800
6	H7004	V.AMSA	33/F	10.3	11.0	4.5	4.1	20	22	8,600	8,700
7	I56347	BALARAMAN	47/M	14.9	14.7	5.2	5.1	16	8	7,600	8,000
8	I42435	MERCY VASANTHA	60/F	13.8	13.1	4.8	4.5	22	10	9200	9,100
9	E04908	NAGEAHWARI	43/f	12.2	12.3	4.4	4.6	3o	40	7,500	7,900
10	H94125	V. SHANTHI	48/F	11.4	10.8	4.2	4.0	60	66	8,400	7500
11	9471	GANESHAN. R	41/M	12.8	12.5	4.5	4.6	34	34	7,700	7,800
12	I85728	MUTHULAKSHMI	35/F	13.5	13.5	4.4	4.3	30	36	7,900	7,800
13	H44555	MALARKODI	55/F	12	12.3	4.4	4.1	30	30	6,900	6,100
14	8720	RANI	58/F	10.3	11.2	4.7	4.5	60	90	6,300	6,400
15	H57980	S. MALLIGA	50/F	11.8	11	4.4	4.2	12	12	8,600	7,900
16.	I73714	UMA	35/F	12.2	12	4.6	4.8	36	76	6,700	6,700
17.	H41678	V.LAXSHMI	55/F	12.6	12.7	4.9	4.5	50	60	9.500	8,500
18.	I73585	MAGI	31/F	12.8	12.3	4.2	4.5	30	36	8,200	8,400
19.	8805	EZHILMATHI	37/F	12.0	12.2	4.4	4.8	50	40	7,600	7,000
20.	I72305	SUNDARARAANI	59/F	11	12	4.5	4.5	40	20	4,500	4,600

LABORATORY INVESTIGATION OP AND IP- BEFORE AND AFTER TREATMENT

				Hb(gm/dl)		TOTAL RBC COUNT (million/cu.mm)		ESR (mm/hour)		TOTAL WBC COUNT	
S.NO	**IP/OP NO**	**NAME**	**AGE/ SEX**	**BT**	**AT**	**BT**	**AT**	**BT**	**AT**	**BT**	**AT**
21.	9487	MUNUSAMY.S	46/M	12.8	13	4.4	4.6	30	30	8,100	8000
22.	I52066	BHUVENEESHWARI	37/F	9.8	10	4.1	4.4	60	80	9,500	9,000
23.	H74965	SANGEETHA	52/F	12.2	12.0	4.4	4.3	30	40	7,100	8,400
24.	F44328	CHANDRA.K	48/F	12	12.2	4.4	4.2	20	16	7000	6,900
25.	H17075	PANJAVARNAM	44/F	12.8	12.6	4.4	4.3	20	36	6,100	6,800
26.	I45702	M. ANAND	27/M	12.4	12.7	4.5	4.7	20	30	6,400	7,000
27.	8842	VANITHA.M	29/F	10.4	10.1	4.4	4.2	44	50	8,000	6,200
28.	9521	C.MUNUSAAMY	58/m	12.2	12.5	4.5	4.6	32	35	6,900	6,700
29.	H36596	P.USHA	46/F	12.7	13.5	4.7	4.9	30	44	7,500	8,800
30.	I02495	S.JAYANTHI	34/F	10	11	4.3	4.2	40	20	4,600	4,500
31.	G45724	PAPAATHI	58/F	12.2	11.6	4.7	4.3	34	24	7,800	6,800
32.	I81587	KRITHIKAA	34/F	12.4	12.5	4.4	4.5	60	30	6,800	6,900
33	I75623	S.SELVI	35/F	10.4	10,7	4,5	4.5	20	30	6000	6500
34.	8864	KALA	29/F	10.6	10.6	4.6	4.5	34	38	6,400	6500
35.	8868	C.SHANTHI	45/F	11	11.6	4.2	4.4	16	8	6,400	6,200
36.	8873	SHAGUNTHALA	45/F	10.9	11.9	4.2	4.4	24	30	9,000	8,700
37.	G97925	DHANAKODI	59/F	11.1	11.2	4.4	4.3	20	20	5,600	5,700
38.	8908	VASANTHA	55/F	12.5	12.5	4.4	4.5	30	28	6,900	6,900
39.	8911	INDHRA	41/F	12.5	12	4.4	4.5	10	8	9,400	9,100
40	I68500	R.SELVI	37/F	10	12	4.6	4.5	10	20	6,600	6,700

LABORATORY INVESTIGATION OP AND IP- BEFORE AND AFTER TREATMENT

				BLOOD GLUCOSE (F)		BLOOD GLUCOSE(PP)		UREA		CREATININE		TOTAL CHOLESTROL	
S.NO	**IP/OP NO**	**NAME**	**AGE/ SEX**	**BT**	**AT**	**BT**	**AT**	**BT**	**AT**	**BT**	**AT**	**BT**	**AT**
1	H42039	MRS KALISELVI	48/f	104	102	124	122	14	14	0.7	0.8	180	192
2	H62467	MANJULA	38/F	97	97	145	109	14	24	0.6	0.8	137	145
3	I57192	MALLIGA	49/F	101	108	110	129	19	21	0.7	0.9	145	149
4	8729	ARUNADEVI.G	48/F	110	108	136	128	26	29	1.1	1.1	167	158
5	D069124	MUMTAJ	60/F	103	113	123	121	18	16	0.8	0.9	148	126
6	H7004	V.AMSA	33/F	110	108	120	128	17	12	1	0.9	195	168
7	I56347	BALARAMAN	47/M	92	84	79	91	19	21	1	1.1	185	178
8	I42435	MERCY VASANTHA	60/F	111	112	127	149	16	20	0.8	0.9	214	199
9	E04908	NAGEAHWARI	43/f	124	112	146	140	12	15	0.8	1	154	149
10	H94125	V. SHANTHI	48/F	101	92.8	151	120	30.5	25.4	0.9	0.9	172	133
11	9471	GANESHAN. R	41/M	102	100	102	97	15	16	1.1	0.9	124	131
12	I85728	MUTHULAKSHMI	35/F	102	109	128	132	23	27	1	1.1	145	143
13	H44555	MALARKODI	55/F	64	78	81	90	15	17	0.8	0.9	138	140
14	8720	RANI	58/F	82	89	102	110	23	32	1	0.9	143	153
15	H57980	S. MALLIGA	50/F	98	101	110	127	27	23	1	0.9	154	147
16.	I73714	UMA	35/F	97	101	140	128	13	12	0.6	0.9	128	129
17.	H41678	V.LAXSHMI	55/F	98	90	128	127	17	18	0.9	1	216	210
18.	I73585	MAGI	31/F	89	83	98	121	10	11	0.7	0.8	144	125
19.	8805	EZHILMATHI	37/F	99	101	110	121	21	25	0.9	0.9	174	162
20.	I72305	SUNDARA RAANI	59/F	101	118	129	132	27	29	0.9	1	145	154

LABORATORY INVESTIGATION OP AND IP- BEFORE AND AFTER TREATMENT

				BLOOD GLUCOSE(F)		BLOOD GLUCOSE(PP)		UREA		CREATININE		TOTAL CHOLESTROL	
S.NO	**IP/OP NO**	**NAME**	**AGE/ SEX**	**BT**	**AT**	**BT**	**AT**	**BT**	**AT**	**BT**	**AT**	**BT**	**AT**
21	9487	MUNUSAMY.S	46/M	109	110	121	134	12	14	1.2	1	143	154
22	I52066	BHUVENEESHWARI	37/F	89	85	108	110	26	24	0.9	0.9	159	160
23	H74965	SANGEETHA	52/F	115	103	140	107	21	17	0.9	0.9	179	149
24	F44328	CHANDRA.K	48/F	88	80	101	110	15	15	0.7	0.8	194	218
25	H17075	PANJAVARNAM	44/F	99	89	101	97	15	16	0.9	0.7	125	126
26	I45702	M. ANAND	27/M	102	105	103	110	21	19	1.1	0.9	146	140
27	8842	VANITHA.M	29/F	88	80	101	110	12	19	0.8	0.7	116	139
28	9521	C.MUNUSAAMY	58/m	84	88	83	98	21	19	1.1	0.9	146	140
29	H36596	P.USHA	46/F	109	101	123	114	15	15	0.7	0.8	194	218
30	I02495	S.JAYANTHI	34/F	96	110	111	123	13	15	0.7	0.7	120	126
31	G45724	PAPAATHI	58/F	98	85	121	128	17	10	0.5	0.6	145	167
32	I81587	KRITHIKAA	34/F	84	88	83	98	19	16	0.9	0.8	124	120
33	I75623	S.SELVI	35/F	89	98	102	110	20	19	0.8	0.8	145	143
34	8864	KALA	29/F	100	90	110	100	13	13	0.7	0.8	138	140
35	8868	C.SHANTHI	45/F	98	95	110	110	15	14	0.5	0.5	158	143
36	8873	SHAGUNTHALA	45/F	83	90	100	120	12	13	0.8	0.7	160	154
37	G97925	DHANAKODI	59/F	98	85	121	128	12	10	0.9	0.9	145	157
38	8908	VASANTHA	55/F	103	98	130	105	24	22	1.0	0.9	189	173
39	8911	INDHRA	41/F	100	95	120	112	18	16	0.7	0.7	167	159
40	I68500	R.SELVI	37/F	88	90	91	95	9	11	0.8	0.9	140	127

LABORATORY INVESTIGATION OP AND IP- BEFORE AND AFTER TREATMENT

				TOTAL BILIRUBIN		CALCIUM		PHOSPHORUS		URIC ACID	
S.NO	**IP/OP NO**	**NAME**	**AGE/ SEX**	**BT**	**AT**	**BT**	**AT**	**BT**	**AT**	**BT**	**AT**
1	H42039	MRS KALISELVI	48/f	0.6	0.5	9.3	9.7	3.7	3.3	3.0	3.2
2	H62467	MANJULA	38/F	0.3	0.3	7.9	8.5	3.6	3.2	2.3	3.4
3	I57192	MALLIGA	49/F	0.8	0.7	8.9	9.2	3.9	4.1	4.5	4.3
4	8729	ARUNADEVI.G	48/F	0.5	0.4	7.7	8.6	4.1	4.2	5.0	4.2
5	D069124	MUMTAJ	60/F	0.4	0.4	4.2	9.2	5.2	3.3	3.5	3.7
6	H7004	V.AMSA	33/F	0.3	0.5	8.1	8	5.8	5.4	3.2	4
7	I56347	BALARAMAN	47/M	0.7	0.6	9.2	7.9	4	3.2	7.2	8.1
8	I42435	MERCY VASANTHA	60/F	0.4	0.4	8.4	8.1	3.6	3.6	4.7	5.2
9	E04908	NAGEAHWARI	43/f	1	0.9	8.5	8	3.3	3	4.3	4
10	H94125	V. SHANTHI	48/F	0.39	0.47	9.2	7.9	3.63	3.51	5.1	4.2
11	9471	GANESHAN. R	41/M	0.5	0.5	10.2	9.9	3.3	3.3	5.7	5.6
12	I85728	MUTHULAKSHMI	35/F	0.5	0.4	10.1	9	3.8	3.6	3	3.2S
13	H44555	MALARKODI	55/F	0.2	0.4	7.8	8.3	5.1	4.9	2.2	3
14	8720	RANI	58/F	0.6	0.7	8.2	8.5	4.7	4.5	3.1	3.1
15	H57980	S. MALLIGA	50/F	0.8	0.8	9.1	9.2	4.1	4.3	5.1	4.5
16	I73714	UMA	35/F	0.4	0.5	7.8	8	2.8	3	4.1	4.5
17	H41678	V.LAXSHMI	55/F	0.3	0.4	8.6	8.3	3.4	4	5.2	5.2
18	I73585	MAGI	31/F	0.7	0.7	8.2	9.2	2.7	3.8	4.4	4.2
19	8805	EZHILMATHI	37/F	0.2	0.4	8.4	8	3.4	3.2	2.6	3
20	I72305	SUNDARARAANI	59/F	0.9	0.7	7.2	7.7	3.9	4.5	4.9	4.5

LABORATORY INVESTIGATION OP AND IP- BEFORE AND AFTER TREATMENT

				TOTAL BILIRUBIN		CALCIUM		PHOSPHORUS		URIC ACID	
S.NO	**IP/OP NO**	**NAME**	**AGE/ SEX**	**BT**	**AT**	**BT**	**AT**	**BT**	**AT**	**BT**	**AT**
21	9487	MUNUSAMY.S	46/M	O.9	O.7	9.8	9.9	4.9	4.9	6.1	5.5
22	I52066	BHUVENEESHWARI	37/F	0.5	0.4	8.4	8.3	4.3	3.9	6.8	5.9
23	H74965	SANGEETHA	52/F	0.3	0.3	9.3	8.9	4	4	3.7	4.3
24	F44328	CHANDRA.K	48/F	0.6	0.4	7.8	8.5	3.9	41	4.5	4.5
25	H17075	PANJAVARNAM	44/F	0.4	0.6	9	8.7	3.1	3.9	3.7	8.9
26	I45702	M. ANAND	27/M	0.4	0.5	8.1	8	3.3	3.5	6.5	6.3
27	8842	VANITHA.M	29/F	0.3	0.3	8	9	3.7	3.9	4.9	4.6
28	9521	C.MUNUSAAMY	58/m	0.8	0.8	7.1	7.5	3.9	4.2	5.1	5.1
29	H36596	P.USHA	46/F	0.3	0.3	8	8.7	3	3.7	4.7	4.9
30	I02495	S.JAYANTHI	34/F	0.2	0.2	8.2	8	3.3	3	5.1	5.3
31	G45724	PAPAATHI	58/F	0.8	0.7	7.0	7.2	4.2	4.2	4.3	4.3
32	I81587	KRITHIKAA	34/F	0.4	0.7	8.4	7.9	2.7	3	3.6	4
33	I75623	S.SELVI	35/F	0.8	0.7	7.3	7.5	3.5	3.5	4.1	4.5
34	8864	KALA	29/F	0.5	O.6	7.9	7.9	3.8	3.7	4.5	4.1
35	8868	C.SHANTHI	45/F	0.9	0.7	8.5	8.7	4.1	42	3.5	3.5
36	8873	SHAGUNTHALA	45/F	1.0	0.9	7.3	7.6	3.9	3.9	4.5	4.3
37	G97925	DHANAKODI	59/F	0.6	0.6	8.5	8.6	3.5	3.3	4	4.5
38	8908	VASANTHA	55/F	0.8	0.6	7.3	7.5	3.9	4.2	5.5	5.4
39	8911	INDHRA	41/F	0.4	0.4	8.1	8.5	4.6	4.5	5.1	4.8
40	I68500	R.SELVI	37/F	0.4	0.5	8.3	8.4	5	5.3	3	3.3

LABORATORY INVESTIGATION OP AND IP- BEFORE AND AFTER TREATMENT

				SGOT		SGPT		ALKALINE PHOSPHATASE	
S.NO	IP/OP NO	NAME	AGE/ SEX	BT	AT	BT	AT	BT	AT
1	H42039	MRS KALISELVI	48/f	21	24	22	28	101	111
2	H62467	MANJULA	38/F	14	14	11	11	72	76
3	I57192	MALLIGA	49/F	12	15	13	13	90	95
4	8729	ARUNADEVI.G	48/F	20	20	18	17	115	118
5	D069124	MUMTAJ	60/F	28	28	23	21	78	72
6	H7004	V.AMSA	33/F	14	13	16	18	75	87
7	I56347	BALARAMAN	47/M	12	14	15	19	100	109
8	I42435	MERCY VASANTHA	60/F	64	14	11	18	79	77
9	E04908	NAGEAHWARI	43/f	15	14	17	19	63	72
10	H94125	V. SHANTHI	48/F	8.1	10.2	10.1	6.2	77	69
11	9471	GANESHAN. R	41/M	13	15	8	8	85	89
12	I85728	MUTHULAKSHMI	35/F	24	24	27	30	60	76
13	H44555	MALARKODI	55/F	9	11	11	13	97	98
14	8720	RANI	58/F	10	12	15	14	85	81
15	H57980	S. MALLIGA	50/F	25	21	19	17	95	99
16.	I73714	UMA	35/F	13	14	11	12	92	87
17.	H41678	V.LAXSHMI	55/F	17	18	13	18	93	98
18.	I73585	MAGI	31/F	18	17	20	16	67	62
19.	8805	EZHILMATHI	37/F	13	16	26	24	91	90
20.	I72305	SUNDARARAANI	59/F	15	14	13	15	87	90

LABORATORY INVESTIGATION OP AND IP- BEFORE AND AFTER TREATMENT

				SGOT		SGPT		ALKALINE PHOSPHATASE	
S.NO	IP/OP NO	NAME	AGE/ SEX	BT	AT	BT	AT	BT	AT
21	9487	MUNUSAMY.S	46/M	29	25	25	21	115	112
22	I52066	Mrs.A BHUVENEESHWARI	37/F	15	12	12	14	108	110
23	H74965	SANGEETHA	52/F	10	13	11	6	109	113
24	F44328	CHANDRA.K	48/F	15	14	13	13	85	85
25	H17075	PANJAVARNAM	44/F	32	18	42	23	90	70
26	I45702	M. ANAND	27/M	10	15	17	19	49	57
27	8842	VANITHA.M	29/F	17	26	14	18	82	69
28	9521	C.MUNUSAAMY	58/M	12	11	13	14	76	72
29	H36596	P.USHA	46/F	12	16	18	11	119	120
30	I02495	S.JAYANTHI	34/F	22	23	21	20	55	60
31	G45724	PAPAATHI	58/F	18	16	15	13	85	82
32	I81587	KRITHIKAA	34/F	14	18	15	13	57	47
33	I75623	S.SELVI	35/F	11	12	14	13	87	90
34	8864	KALA	29/F	27	24	22	22	115	110
35	8868	C.SHANTHI	45/F	18	18	16	14	83	80
36	8873	SHAGUNTHALA	45/F	6	7	11	10	63	63
37	G97925	DHANAKODI	59/F	25	26	7	8	101	99
38	8908	VASANTHA	55/F	9	10	11	12	65	64
39	8911	INDHRA	41/F	21	20	18	17	89	87
40	I68500	R.SELVI	37/F	18	15	13	17	54	60

LABORATORY INVESTIGATION OP AND IP- BEFORE AND AFTER TREATMENT

				URINE SUGUR(R)		URINE SUGUR(PP)		ALBUMIN		DEPOSITS			
										Epithelial cells		Pus cells	
S.NO	IP/OP NO	NAME	AGE/ SEX	BT	AT	BT	AT	BT	AT	BT	AT	BT	AT
1	H42039	Kaliselvi	48/f	NIL	NIL	NIL	NIL	NIL	NIL	1-2	1-3	1-2	1-3
2	H62467	Manjula	38/F	NIL	NIL	NIL	NIL	NIL	NIL	1-4	1-2	1-2	1-2
3	I57192	Malliga	49/F	NIL	NIL	NIL	NIL	NIL	NIL	2-5	1-2	3-4	1-3
4	8729	Arunadevi.G	48/F	NIL	NIL	NIL	NIL	NIL	NIL	1-2	1-2	1-3	1-3
5	D069124	Mumtaj	60/F	NIL	NIL	NIL	NIL	NIL	NIL	1-5	1-3	2-1	1-2
6	H7004	V.Amsa	33/F	NIL	NIL	NIL	NIL	NIL	NIL	1-2	1-2	1-2	1-2
7	I56347	Balaraman	47/M	NIL	NIL	NIL	NIL	NIL	NIL	2-6	2-5	1-3	1-3
8	I42435	Mercy Vasantha	60/F	NIL	NIL	NIL	NIL	NIL	NIL	2-4	1-3	2-3	1-2
9	E04908	Nageahwari	43/f	NIL	NIL	NIL	NIL	NIL	NIL	1-2	1-3	1-2	1-2
10	H94125	V. Shanthi	48/F	NIL	NIL	NIL	NIL	NIL	NIL	1-5	1-3	1-2	1-2
11	9471	Ganeshan. R	41/M	NIL	NIL	NIL	NIL	NIL	NIL	1-2	1-2	1-2	1-2
12	I85728	Muthulakshmi	35/F	NIL	NIL	NIL	NIL	NIL	NIL	2-6	2-4	1-2	1-3
13	H44555	Malarkodi	55/F	NIL	NIL	NIL	NIL	NIL	NIL	2-4	2-3	1-2	1-2
14	8720	Rani	58/F	NIL	NIL	NIL	NIL	NIL	NIL	2-7	2-3	2-3	2-3
15	H57980	S. Malliga	50/F	NIL	NIL	NIL	NIL	NIL	NIL	1-2	1-2	1-2	1-2
16	I73714	Uma	35/F	NIL	NIL	NIL	NIL	NIL	NIL	1-2	1-2	2-3	1-2
17	H41678	V.Laxshmi	55/F	NIL	NIL	NIL	NIL	NIL	NIL	2-4	2-4	2-3	2-3
18	I73585	Magi	31/F	NIL	NIL	NIL	NIL	NIL	NIL	1-2	1-2	2-3	2-3
19	8805	Ezhilmathi	37/F	NIL	NIL	NIL	NIL	NIL	NIL	1-2	1-2	1-2	1-2
20	I72305	Sundararaani	59/F	NIL	NIL	NIL	NIL	NIL	NIL	2-6	2-4	1-3	1-2

LABORATORY INVESTIGATION OP AND IP- BEFORE AND AFTER TREATMENT

				URINE SUGUR(R)		URINE SUGUR(PP)		ALBUMIN		DEPOSITS			
										Epithelial cells		Pus cells	
S.NO	IP/OP NO	NAME	AGE/ SEX	BT	AT	BT	AT	BT	AT	BT	AT	BT	AT
21	9487	Munusamy.S	46/M	NIL	NIL	NIL	NIL	NIL	NIL	1-3	1-3	1-2	1-2
22	I52066	Bhuveneeshwari	37/F	NIL	NIL	NIL	NIL	NIL	NIL	1-3	1-3	1-3	1-3
23	H74965	Sangeetha	52/F	NIL	NIL	NIL	NIL	NIL	NIL	1-3	1-3	1-2	1-2
24	F44328	Chandra.K	48/F	NIL	NIL	NIL	NIL	NIL	NIL	2-3	1-3	1-2	1-2
25	H17075	Panjavarnam	44/F	NIL	NIL	NIL	NIL	NIL	NIL	1-3	1-3	1-3	1-3
26	I45702	M. Anand	27/M	NIL	NIL	NIL	NIL	NIL	NIL	2-4	2-4	1-3	1-2
27	8842	Vanitha.M	29/F	NIL	NIL	NIL	NIL	NIL	NIL	1-3	1-4	1-2	1-3
28	9521	C.Munusaamy	58/M	NIL	NIL	NIL	NIL	NIL	NIL	1-3	1-3	1-2	1-2
29	H36596	P.Usha	46/F	NIL	NIL	NIL	NIL	NIL	NIL	1-3	1-3	2-3	2-3
30	I02495	S.Jayanthi	34/F	NIL	NIL	NIL	NIL	NIL	NIL	2-4	2-4	1-3	1-3
31	G45724	Papaathi	58/F	NIL	NIL	NIL	NIL	NIL	NIL	2-4	2-4	1-3	1-2
32	I81587	Krithikaa	34/F	NIL	NIL	NIL	NIL	NIL	NIL	2-3	1-2	2-3	1-2
33	I75623	S.Selvi	35/F	NIL	NIL	NIL	NIL	NIL	NIL	4-6	4-6	2-3	2-3
34	8864	Kala	29/F	NIL	NIL	NIL	NIL	NIL	NIL	1-3	1-3	1-2	1-2
35	8868	C.Shanthi	45/F	NIL	NIL	NIL	NIL	NIL	NIL	1-3	1-3	2-3	2-3
36	8873	Shagunthala	45/F	NIL	NIL	NIL	NIL	NIL	NIL	3-5	1-2	1-3	1-3
37	G97925	Dhanakodi	59/F	NIL	NIL	NIL	NIL	NIL	NIL	1-3	1-4	2-3	2-3
38	8908	Vasantha	55/F	NIL	NIL	NIL	NIL	NIL	NIL	2-3	2-3	1-2	1-2
39	8911	Indhra	41/F	NIL	NIL	NIL	NIL	NIL	NIL	1-2	1-2	1-2	1-2
40	I68500	R.Selvi	37/F	NIL	NIL	NIL	NIL	NIL	NIL	1-2	1-2	1-3	1-3

S.NO	IP/OP NO	NAME	AGE/ SEX	ASO		CRP		RA FACTOR	
				BT	AT	BT	AT	BT	AT
1	H42039	Kaliselvi	48/f	-	-	+	+	+	+
2	H62467	Manjula	38/F	-	-	+	+	+	+
3	I57192	Malliga	49/F	-	-	+	+	+	+
4	8729	Arunadevi.G	48/F	-	-	+	+	+	+
5	D069124	Mumtaj	60/F	--	--	+	+	+	+
6	H7004	V.Amsa	33/F	-	-	+	+	+	+
7	I56347	Balaraman	47/M	-	-	+	+	+	+
8	I42435	Mercy Vasantha	60/F	-	-	+	+	+	+
9	E04908	Nageahwari	43/f	+	+	+	+	+	+
10	H94125	V. Shanthi	48/F	-	-	+	+	+	+
11	9471	Ganeshan. R	41/M	-	-	+	+	+	+
12	I85728	Muthulakshmi	35/F	-	-	+	+	+	+
13	H44555	Malarkodi	55/F	-	-	+	+	+	+
14	8720	Rani	58/F	-	-	+	+	+	+
15	H57980	S. Malliga	50/F	+	+	+	+	+	+
16	I73714	Uma	35/F	-	-	+	+	+	+
17	H41678	V.Laxshmi	55/F	-	-	+	+	+	+
18	I73585	Magi	31/F	-	-	+	+	+	+
19	8805	Ezhilmathi	37/F	+	+	+	+	+	+
20	I72305	Sundararaani	59/F	-	-	+	+	+	+

21	9487	Munusamy.S	46/M	-	-	+	+	+	+
22	I52066	Bhuveneeshwari	37/F	-	-	+	+	+	+
23	H74965	Sangeetha	52/F	-	-	+	+	+	+
24	F44328	Chandra.K	48/F	+	+	+	+	+	+
25	H17075	Panjavarnam	44/F	-	-	+	+	+	+
26	I45702	M. Anand	27/M	-	-	+	+	+	+
27	8842	Vanitha.M	29/F	-	-	+	+	+	+
28	9521	C.Munusaamy	58/M	-	-	+	+	+	+
29	H36596	P.Usha	46/F	-	-	+	+	+	+
30	I02495	S.Jayanthi	34/F	-	-	+	+	+	+
31	G45724	Papaathi	58/F	-	-	+	+	+	+
32	I81587	Krithikaa	34/F	-	-	+	+	+	+
33	I75623	S.Selvi	35/F	-	-	+	+	+	+
34	8864	Kala	29/F	+	+	+	+	+	+
35	8868	C.Shanthi	45/F	-	-	+	+	+	+
36	8873	Shagunthala	45/F	-	-	+	+	+	+
37	G97925	Dhanakodi	59/F	-	-	+	+	+	+
38	8908	Vasantha	55/F	-	-	+	+	+	+
39	8911	Indhra	41/F	-	-	+	+	+	+
40	I68500	R.Selvi	37/F	-	-	+	+	+	+

STATISTICAL ANALYSIS

All collected data were entered into MS Excel software using different columns as variables and rows as patients. SPSS software was used to perform statistical analysis. Basic descriptive statistics include frequency distributions and cross-tabulations were performed. The quantity variables were expressed as Mean ± Standard Deviation and qualitative data as percentage. A probability value of <0.05 was considered to indicate as statistical significance. Paired 't' test was performed for determining the significance between before and after treatment.

Paired Sample Statistics (pain scale) Score before Treatment and After Treatment)

Variable	Obs	Mean±SD	t Value	p Value
Before treatment	40	8±0.7845	T=19.133	P<0.0001
After treatment	40	3.95±1.663		

The mean± standard deviation of pain scale score at before and after treatment were 8±0.7845and3.95±1.663 respectively which is statistically significant (t=19.133, p<0.0001).

DISCUSSION

The Aim of the study is to Evaluate the Therapeutic efficacy of the drug *"Vaatha Chooranam"* in reducing the pain and restricted movement in treating *Vali Azhal Keel Vaayu.* The clinical features of *Vali Azhal Keel Vaayu* in siddha literature can be correlated to Rheumatoid Arthritis in modern science. Rheumatiod Arthritis is a chronic inflammatory destructive and deforming polyarthritis Associated with symmetrically involved joints.

Vali Azhal Keel Vaayu is a vaatha disease which causes derangements of Vaathakutram which causes increasing pitham and kabam kutram.

Vaathathathu is responsible for the functioning of udal Thathukal uniformly derangement of Vaatha kutram leads to pricking pain over the body, body ache and increase in Pitha kutram causes swelling and increased body temperature, finally Kaba kutram accompanies causing stiffness, restricted of movements.

As *Vali Azhal Keel Vaayu* is a Auto immune disease drugs which possess the property of Anti-vaatha, Anti-inflammatory, Analgesic, Anti-oxidant property as mentioned in siddha literature were selected and the trail drug were prepared by the Author in the Gunapadam practical laboratory of National Institute of Siddha, after getting proper authentication of raw drugs from the Medicinal botany department at NIS, Chennai 47, under the supervision of the members of the teaching faculty and guided by the Head of the Department of Sirappu Maruthuvam of the National Institute of Siddha, Chennai - 47. The trial drug was prepared by the standard operating procedure as mentioned in the protocol.

The safety of the trial drug usage and standardization of the trial drug through biochemical analysis were also ensured during the study.

The Preclinical toxicity studies (Acute toxicity) for the above said trial drug was conducted at National Institute of Siddha, after getting the proper acceptance and permission from the Institutional Animal Ethical Committee (IAEC). The trial drug was proved to be safe for human beings from the observations made from the study.

The Biochemical qualitative and quantitative analysis were done at the biochemistry lab of NIS and IIT Chennai respectively. It revealed the presence of effective minerals and the existence of the drug molecules at micro level.

The clinical study was conducted with a well-defined protocol and a proper proforma after the approval of the Institutional Ethical Committee. After screening patients reporting at the OPD of department of Sirappu Maruthuvam, 40 cases were selected for induction to the trial. Before enrolment into the trial the informed consent was obtained from the patients.

40 patients of both genders were recruited for this study. Among the 40 patients 28 were OPD patients and the remaining 12 were IPD patients. For In-Patients, who were not in a situation to stay in the hospital for a long time, were advised to attend the Out-Patient Department of Sirappu Maruthuvam for further follow- up.

The treatment was aimed at normalizing the deranged thodams and providing relief from symptoms. Before treatment the patients were advised to take Meganathakulikai– 2 od with hot water in early morning for purgation. On that day patient was advised to take rest without internal medicine.

The patients were treated with trial drugs *Vaatha Chooranam* twice a day with honey and Vaatha Mega Narayana Ennai(external) for 48 days . Patients were instructed to take the medicines regularly, advised to follow pathiyam (avoid tamarind, tubers, etc.) and advised to avoid cold exposure .Out-Patients were asked to visit the hospital once in 7 days. For Out-Patients the drugs were given for 48 days and the clinical assessment was done on 0^{th} day, 8^{th} day, 15^{th} day, 22^{th} day , 29^{th} day, 36^{th} day, 43^{th} day and 49^{th} day.

After the treatment, the patients were advised to visit the Out-Patient ward of Department of Sirappu Maruthuvam for next 2 months for follow-up.

From this study, Among the 40 cases, the Gender of the disease was found to be higher in females (90%) and lower in males (10%).

In Age group, 7.5% of the affected patients came under the age group between 20-30 years. 30 % of the patients fall under the age group between 31-40

years, 37.5 % of them were between 41-50 years and 25 % of them were between 51-60 years.

In my study while seeing socio-economic status of the patients the disease was found to be in 80% of Middle income group .7.5 % of casesin high income group and 12.5%. cases in the low income group.

In Occupational distribution,Among 40 cases 55% were homemakers, 7.5. % were tailors, 2.5% were handloom workers and lab assistant and 22.5% of them were coolie

In diet Non vegetarian 80% were very higher than the vegetarian 20%.

In Thinai all the 100% of cases were from Neithal thinai which mention that vaatha disease are common in Neithal thinai

In ParuvaKaalam (Season)Out of 40 cases 80% of cases were taken in Pinpani kaalam and 20% of cases were taken in Ilavenil kaalam.

In Gunam all the cases had Rasogunam,.

In Body constitution all 100% of cases, were under Thonthathegi.

In vaatham,Viyaanan and Samanan was affected in all cases 100%, Abanan affected in 5% and Kirkaran was affected in 17.5%

In Azhal, Ranjagampitam, Saathagapitham was affected in all cases 100% and Anarpitham was affected in 17.5%.

In Iyam, Santhigam was affected in all the cases 100%.

In Envagai Thervu, Vathapithanaadi was found in 50% of cases, Pithavathanaadi was found in 25%, kabapithamnaadi was found in 15% of cases and kaba vaatham in 10%. Sparisam was affected in all cases 100% and Malam was affected (constipation) in 5% of patients.

In Neikkuri Vathaneer was found in 20% of cases, Kabaneer was found in 80% of cases.

In Udalthaathukkal Saram, Seneer, Oon, and Enbu were affected in 100% of cases and kozhuppu was affected in 50%of cases.

In Kanmendrium Kai and Kaal were affected in 100% of cases, and karuvaai affected in 5% of cases

In Duration of illness, about 12.5% cases had 3-10 yrs of duration, 20% cases had 2-3 yrs of duration, 20% cases had 1-2 yrs of duration, 32.5% cases had 6 mon – 1yr of duration and 15% cases had 6 months of duration.

According to the clinical featuresall 100% of cases had pain, swelling, early morning stiffness, warmth, tenderness, and restricted movements. 5% cases had fever, cases , 20% cases had deformities, 90% cases had polyarthralgia and 17.5% cases had anorexia symptoms

Among the Deformities, 30% of cases had spindle shaped deformity, 10% of cases had hallus valgus derormity, 45% of cases had ulnar deviation and 12.5% of cases had swan neck deformity.

In Joint involvement,wrist was affected in 87.5%, MCP joints were involved in 92.5% cases, Knee joint 100%, PIP joints were in 85% , Ankle joint was involved in 90% cases, Elbow joint was involved in 90% cases , Lumbosacral joint was involved in 15% cases, Cervical vertebrae were involved in 25% cases, and Hip joint was involved in 35% cases.

In this study, Before treatment, 70% of cases had severe pain remaining cases 30% had moderate pain. After treatment 7.5% had severe pain, 50% had Moderate pain and 42.5% had Mild pain.

In this study, Before treatment, 32.5% of cases had mild restriction, 67.5% had moderate restriction, After treatment 57.5% cases were fit for all activities, 35% ofcases had moderate restriction.

Overall Results are 25% cases showed Good improvement50% cases showed Moderate improvement, 17.5% cases showed Mild improvement.

Laboratory investigation of blood and urine were done for all 40 cases. There were no significant changes in blood and urine parameters before and after treatment.

The pain assessment was done in all the 40 patients participated in the trial The mean pain score before treatment is 8 after treatment it is reduced to 3.95**.**

The acute toxicity study was conducted for the trial drug *Vali Azhal Keel Vaayu* in National Institute of Siddha and it showed no abnormal results. Hence the safety of the trial drug was also proved.

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SUMMARY

The disease ***Vali Azhal Keel Vaayu*** was taken for the clinical study with ***Vaatha Chooranam*** as internal medicine and ***Vaatha Mega Narayana Ennai*** as external application. For the clinical study, 40 cases were selected based on the approved protocol.

This study has been approved by **IEC of NIS [Date of IEC Approval & its number: NIS/IEC/9-2014-15/12-26.08.2015].** Animal studies were carried out after obtaining approval from the Institutional Animal Ethical Committee (IAEC) and the trial was registered in Clinical Trial Registry of India **(CTRI/2017/05/008594.)** Hence the study is safely executed on patients and there was no adverse drug reactions noted during the study period.

The toxicological evaluations were conducted as per WHO guidelines for safety evaluation of ***Vaatha Chooranam***. In short term and long term toxicity study, no signs of toxicity and mortality were observed through out the study.

In organs of Control group, no abnormality was detected. The normal histological structure present in test group of animals.

40 cases, were treated with trial medicine in OPD, IPD of Department of Sirappu Maruthuvam, Ayothidoss Pandithar Hospital of National Institute of Siddha, Chennai-47. The detailed study on ***Vaatha Chooranam*** with reference to its aetiology, pathogenesis, investigations, clinical features, diagnosis and treatment with trial drugs were done.

The patients were diagnosed and included on the basis of EULAR (European league Against Rheumatism scale) and the results were observed by Pain scale and restricted movements scale before and after treatment. Among the 40 cases treated, 42.5%% cases shows Good improvement, and 50% shows Moderate improvement 7.5% shown Mild improvement.

CONCLUSION

This study proved that the formulation given good results in many patients through clinical trials and it may be better solution for reducing the pain, swelling and restricted movements. This brought confident in rheumatoid patients which increases the quality of life.

No adverse effects were noted during the course of treatment. Short term and long term study of the trial drug is safe, it does not produce any toxic effects in rats. This shows that the trial drug ***Vaatha Chooranam*** (Internal) and ***Vaatha Mega Narayana Ennai*** (External) both is safest drug for human beings.

The Tamil Nadu Dr.M.G.R.Medical University

69,Anna Salai,Guindy,Chennai - 600 032.

This Certificate is awarded to Dr/Mr/Mrs.....T. R. Nishitha.....

for participating as ~~Resource Perso~~n / Delegate in the Nineteenth Workshop on

" RESEARCH METHODOLOGY & BIOSTATISTICS "

*For **AYUSH Post Graduates & Researchers***

Organized by the Department of Siddha

The Tamil Nadu Dr. M.G.R. Medical University from 07 th to 11 th September 2015.

Dr.N.KABILAN, M.D.(Siddha)
READER,DEPT.OF SIDDHA

Prof. **Dr.P.ARUMUGAM,** M.D.,
REGISTRAR I/C

Prof. **Dr.D.SHANTHARAM,** M.D., D.Diab.,
VICE CHANCELLOR

NATIONAL INSTITUTE OF SIDDHA
राष्ट्रीय सिद्ध संसथान

Department of AYUSH- MINISTRY OF HEALTH & FAMILY WELFARE
आयुष विभाग - स्वास्थ एवं परिवार कल्याण मंत्रालय
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F.No.NIS/6-20/IEC/15-16 Dt: 05.10.2015

CERTIFICATE

Address of Ethics Committee: National Institute of Siddha, Tambaram Sanatorium, Chennai-600047, Tamil Nadu, India	
Principal Investigator:Dr.T.R.Nishitha, Department of Sirappu Maruthuvam	
Protocol title: "Preclinical and Clinical Study of Vatha Chooranam (Internal Medicine) and Vatha Mega Narayana Ennai (External Medicine) in the treatment of Vali Azhal Keel Vayu [Rheumatoid Arthritis]	
Documents filed	1) Protocol, 2) Data Collection forms 3) SAE(Pharmacovigilance)
Clinical trial Protocol (others – Specify)	Yes
Informed consent documents	Yes
Any other documents	-
Date of IEC approval & its number	**NIS/IEC/9/2014-15/12 – 26.08.2015**

We approve the trial to be conducted in its presented form.

The Institutional Ethics Committee expects to be informed about the progress of the study, any SAE occurring in the course of the study.

Chairman **Member Secretary**

CERTIFICATE

This is certify that the project title. Preclinical and clinical study of Siddha drug Vaatha Chooranam and Vathanasiyna ennai (External) in the treatment of Valiazhal (External) Keel vayu (Rheumatoid Arthritis) **has been approved by the IAEC.**
100 Rats (50 M + 50 F) - Approval NO: NIS/IAEC-III/05/29092016

Prof. Dr. V. Banumathi — **Name of Chairman/~~Member Secretary~~ IAEC:**

Prof. Dr. K. Nachimuthu. — **Name of CPCSEA nominee:**

Signature with date

V. Banumathi 17/11/16 — **Chairman/~~Member Secretary~~ of IAEC:**

CPCSEA nominee:

(Kindly make sure that minutes of the meeting duly signed by all the participants are maintained by Office)

Name Of The Principal Investigator – Dr. T. R. Nishitha.

Name Of the Department - Sirappu Maruthuvam

NATIONAL INSTITUTE OF SIDDHA, CHENNAI – 600047

BOTANICAL CERTIFICATE

Certified that the following plant drugs used in the Siddha formulation **"Vaatha chooranam"** (Internal) and **Vaatha MegaNarayana Ennai** (External) for taken up for Post Graduation Dissertation studies by **Dr.T.R.Nishitha**, M.D.(S), II year, Department of Sirappu Maruthuvam, 2016, are identified through Visual inspection, Experience, Education & Training, Organoleptic characters, Morphology and Taxonomical methods as

Smilax china Linn. (Liliaceae), Root
Glycyrrhiza glabra Linn. (Fabaceae), Root
Terminalia chebula Retz. (Combretaceae), Fruit
Phyllanthus emblica Linn. (Euphorbiaceae), Fruit
Terminalia belerica Roxb. (Combretaceae), Fruit
Kaempferia galanga Linn. (Zingiberaceae), Rhizome
Syzygium aromaticum (Linn.) Merr. & L.M. Perry (Myrtaceae), Flower bud
Cedrus deodara (Roxb.) Loud. (Pinaceae), Wood
Aconitum heterophyllum Wall. (Ranunculaceae), Root
Zingiber officinale Rosc. (Zingiberaceae), Rhizome.
Piper nigrum Linn. (Piperaceae), Fruit
Piper longum Linn. (Piperaceae), Fruit
Plumbago zeylanica Linn. (Plumbaginaceae), Root
Acorus calamus Linn. (Araceae), Rhizome
Picrorhiza kurroa Royle ex Benth. (Scrophulariaceae), Root
Ferula foetida Regel (Apiaceae), Oleo-gumresin
Anethum sowa Kurz (Apiaceae), Fruit
Allium sativum Linn. (Liliaceae), Bulb
Trachyspermum ammi (Linn.) Sprague (Apiaceae), Fruit
Embelia ribes Burm.f. (Myrsinaceae), Fruit

MEDICINAL BOTANY CHENNAI 600 047 National Institute of Siddha

Certificate No: NISMB2612016

Date: 19-12-2016

Authorized Signatory

Dr. D. ARAVIND, M.D.(s),M.Sc.,
Assistant Professor
Department of Medicinal Botany
National Institute of Siddha
Chennai - 600 047, INDIA

NATIONAL INSTITUTE OF SIDDHA AYOTHIDOSS PANDITHAR HOSPITAL, CHENNAI – 600 047.

DEPARTMENT OF SIRAPPU MARUTHUVAM

PRECLINICAL AND CLINICAL STUDY OF SIDDHA DRUG "*VAATHA CHOORANAM*" (INTERNAL) AND "*VAATHA MEGA NARAYANA ENNAI*" (EXTERNAL) IN THE TREATMENT OF "*VALI AZHAL KEEL VAYU*" (RHEUMATOID ARTHRITIS)

Principal Investigator: Dr.T.R.Nishitha

FORM I- SCREENING & SELECTION PROFOMA

1. SERIAL NO: **2.OP/IPNO:**

3. NAME: **4.AGE/GENDER:**

5.OCCUPATION: **6. INCOME:**

7. ADDRESS AND CONTACT NO:

INCLUSION CRITERIA:

- Age: 20- 60 years YES/NO.
- Sex: Both male and female M/F
- Any of the following three symptoms

  Pain and swelling in three or more joint YES/NO

  Morning Stiffness YES/NO

  Rheumatoid factor positive YES/NO

  Deformities like Swan neck and Butttonhole deformity YES/NO

  Rheumatoid nodules YES/NO
- Symmetrical joints involvement YES/NO
- patient willing to undergo laboratory Investigation YES/NO
- Patient willing to sign the informed consent. YES/NO

EXCLUSION CRITERIA:

- Pregnancy and lactation YES/NO
- Tubercular arthritis YES/NO
- Gouty arthritis YES/NO
- Diabetic Mellitus YES/NO
- Malignant Hypertension YES/NO
- Any other systemic illness YES/NO

ADMITTED TO TRAIL	**YES**	**NO**
	☐	☐
IF YES	**OPD**	**IPD**
	☐	☐

Date:

Station:

Signature of the Investigator:

Signature of the Lecturer: **Signature of the HOD**

NATIONAL INSTITUTE OF SIDDHA

AYOTHIDOSS PANDITHAR HOSPITAL,

CHENNAI – 600 047.

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PRECLINICAL AND CLINICAL STUDY OF SIDDHA DRUG *"VAATHA CHOORANAM"*(INTERNAL) AND"*VAATHA MEGA NARAYANA ENNAI"*(EXTERNAL) IN THE TREATMENT OF*"VALI AZHAL KEEL VAYU"* (*RHEUMATOID ARTHRITIS*)

Principal Investigator: Dr.T.R.Nishitha

FORM II- – HISTORY TAKING PROFORMA

1. SI NO : -------- **2 OP \IP NO : --------**
3. NAME: -------- **3. AGE /SEX : -------**
4. OCCUPATION :--------- **5. MARITAL STATUS**: Married/unmarried

COMPLAINS AND DURATION

PERSONAL HISTORY:

PERSONAL HABITS	YES	NO	IF YES SPECIFY DURATION	AMOUNT/Quantity
Smoking				
Tobacco Chewing				
Alcohol				
Narcotic Drug Addiction				

HISTORY OF PREVIOUS ILLNESS AND TREATMENT TAKEN:

FAMILY HISTORY:

Whether this problem runs in family? 1. Yes ☐ 2.No ☐

If yes, mention the relationship of affected person(s)

1._____ 2._____

DIETARY HABIT:

1.Vegetarian ☐ 2.Non-vegetarian ☐

MENSTRUAL AND OBSTETRIC HISTORY:

Date:

Station:

Signature of the Investigator:

Signature of the Lecturer: **Signature of the HOD**

NATIONAL INSTITUTE OF SIDDHA

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DEPARTMENT OF SIRAPPU MARUTHUVAM

COMPARATIVE CLINICAL STUDY OF SIDDHA DRUG *"VAATHA CHOORANAM"* (INTERNAL) AND *VATHA MEGA NARAYANA ENNAI""* (EXTERNAL) IN THE TREATMENT OF *"VALI AZHAL KEEL VAYU"* (RHEUMATOID ARTHRITIS)

Principal Investigator: Dr.T.R.Nishitha

FORM -III CLINICAL ASSESSMENT DURING & AFTER TRIAL

1. OP/ IP NO: …… **2. SL. NO: ……**

3.NAME: …… **4. AGE/SEX: ……**

5. DATE OF RECRUITMENT: ……

GENERAL EXAMINATION:

1. Body weight [Kg]
2. Height [cms]
3. Body Temperature [^{0}F]
4. Blood Pressure (mm/Hg)
5. Pulse Rate /min
6. Heart Rate / min.
7. Respiratory Rate /min.

		Yes	**No**
8. Pallor	:	☐	☐
9. Jaundice	:	☐	☐
10. Clubbing	:	☐	☐
11. Cyanosis	:	☐	☐
12. Pedal Oedema	:	☐	☐
13. Lymphadenopathy	:	☐	☐
14. Jugular venous pulsation	:	☐	☐

SYSTEMIC EXAMINATION:	**Normal**	**Abnormal**
1. Cardio-vascular system	☐	☐
2. Respiratory system	☐	☐
3. Gastro intestinal system	☐	☐
4. Central nervous system	☐	☐
5. Uro-genital system	☐	☐
6. Endocrine system	☐	☐

SIDDHA SYSTEM OF EXAMINATION

1. THEGI (TYPE OF BODY CONSTITUTION):

1. Vaathaudal ☐ 3. Kabaudal ☐

2. Pithaudal ☐ 4. Thonthaudal ☐

2. NILAM (LAND WHERE THE PATIENT LIVED MOST):

1. Kurinji ☐ 3. Paalai ☐

2. Mullai ☐ 4. Neithal ☐

5. Marutham ☐

3. KAALAM:

1. Kaarkaalam ☐ 4. Pinpanikaalam ☐

2. Koothirkaalam ☐ 5. Ilavenilkaalam ☐

3. Munpanikaalam ☐ 6. Muthuvenilkaalam ☐

4. GUNAM:

1. Sathuvam ☐ 2. Rasogunam ☐

3. Thamogunam ☐

5.PORIPULANGAL(SENSORY ORGANS):

	1st day	**8th day**	**15th day**	**22nd day**	**29th day**	**36th day**	**43rd Day**	**49th day**
Mei (skin)								
Vaai(tongue)								
Kan (eye)								
Mooku(nose)								
Sevi (ear)								

6.KANMENDRIYAM(MOTOR ORGANS):

	1st day	8th day	15th day	22nd day	29th day	36th day	43rd day	49th day
Kai(upperlimb)								
Kaal(lowerlimb)								
Vaai(speech)								
Eruvai (excretory organ)								
Karuvai (reproductive organs)								

7.KOSANGAL (SHEATH):

	1st day	8th day	15th day	22nd day	29th day	36th day	43rd day	49th day
AnnamayaKosam								
Pranamaya kosam								
Manomayakosam								
Vignanamayakosam								
Aanandhamayakosam								

8.UYIR THATHUKKAL (THREE HUMOURS):

A. VALI

	1st day	8thday	15th day	22nd day	29th day	36th day	43rd day	49th day
Praanan								
Abaanan								
Viyaanan								

Udhaanan								
Samaanan								
Naagan								
Koorman								
Kirukaran								
Devathathan								
Dhananjeyan								

B) AZHAL

	1st day	**8th day**	**15th day**	**22nd day**	**29th day**	**36th day**	**43rd day**	**49th day**
Analakam								
Prasakam								
Ranjakam								
Aalosakam								
Saathakam								

C. IYAM:

	1st day	**8th day**	**15th day**	**22nd day**	**29th day**	**36th day**	**43rd day**	**49th day**
Avalambagam								
Kilethagam								
Pothagam								
Tharpagam								
Santhigam								

9.SEVEN UDAL DHATHUS: (7 SOMATIC COMPONENTS)

	1st day	8th day	15th day	22nd day	29th day	36th day	43rd day	49th day
Saaram								
Senneer								
Oon								
Kozhuppu								
Enbu								
Moolai								
Sukkilam / Suronitham								

ENVAGAI THERVU: [EIGHT TYPES OF EXAMINATION]

I. NAADI: [PULSE PERCEPTION]

1st Day	8th day	15thday	22nday	29th day	36th day	43rd day	49th day

II. SPARISAM:

1st Day	8th Day	15th Day	22nd day	29th day	36th day	43rd day	49th day

III. NAA:[TONGUE]

1st Day	8th Day	15th Day	22nd Day	29th Day	36th Day	43rd Day	49th Day

VI.NIRAM: [COMPLEXION]

1. Vaatham ☐ 3. Kabam ☐

2. Pitham ☐

V.MOZHI: [VOICE]

1. High Pitched ☐ 2. Low Pitched ☐

3. Medium Pitched ☐

VI.VIZHI: [EYES]

1st Day	8th Day	15th Day	22th Day	29th Day	36th Day	43rd Day	49th Day

VII. MALAM: [BOWEL HABITS / STOOLS]

	Before treatment	After treatment
Niram		
Irugal		
Ilagal		
Others		

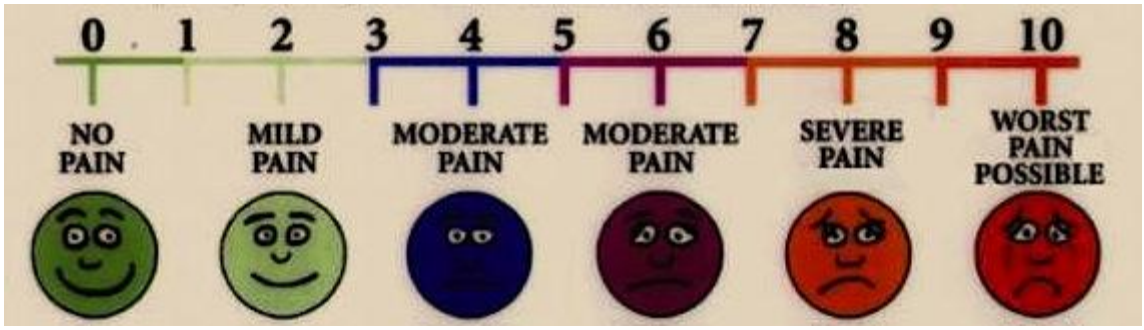
VIII. MOOTHIRAM [URINE EXAMINATION]

Neerkkuri	Before treatment	After treatment
Niram		
Manam		
Edai		
Nurai		
Enjal		

NEIKURI	Before treatment	After treatment
Aravu (Serpentine fashion)		
Aazhi (Annular/Ringed fashion)		
Muthu (Pearl beaded fashion)		
Kalappu (Mixed fashion)		
Other fashion		

Outcome:

I. UNIVERSAL PAIN ASSESMENT SCALE:



Grade**0** **:** No Pain

Grade **1-3** **:** Mild pain

Grade **4-6** **:** Moderate pain

Grade **7-10** **:** Severe pain

II. RESTRICTED MOVEMENT ASSESSMENT SCALE:GRADATION OF MOVEMENTS

Grade 1 – Able to perform normal duties

Grade II – Moderate Restriction – Self care is possible

Grade III – Marked restriction – Limited self care /some assistance required.

Grade IV – Confined to bed or wheel chair

(Ref: Clinical manual for nursing practice (National Institute of Health Warren Grant Magnuson Clinical Centre)

	1st day	8th day	15th day	22nd day	29th day	36th day	43rd day	49th day
Date								
Pain								
Tender Ness								
swelling								
Morning Stiffness								
Restriction Of movements								
Duration of relief								
Other clinical features.								

Date:

Station:

Signature of the Investigator:

Signature of the Lecturer: **Signature of HOD**

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Principal Investigator: Dr.T.R.Nishitha

1. SERIAL NO:

2. OP /IP NO:

3. NAME:

4. AGE/GENDER:

FORM-IV - LABORATORY INVESTIGATIONS

BLOOD INVESTIGATIONS		NORMAL VALUES	BEFORE TMT (DATE)	AFTER TMT (DATE)
Hb (gm/dl)		M:12-15 W:11.5-12		
T.WBC (cells/cu.mm)		4000-11000		
DIFFERENTIAL COUNT (%)	Polymorphs	40-75		
	Lymphocytes	20-40		
	Monocytes	2-10		
	Eosinophils	1-6		
	Basophils	0-1		
T.RBC (million cells / cu.mm)		M:4.0-5.5 W:3.5-4.5		
ESR (mm/hour)	½ hr.	M:6-12 W:7-18		
	1 hr.			
Blood glucose (mg/dl)	Fasting	70-110		
	PP	80-140		
	Random	80-120		
RFT (mg/dl)	Blood urea	16-50		
	Serum Creatinine	0.6-1.2		
LFT (mg/dl)	Total bilirubin	0.2-1.2		
	Direct bilirubin	0.1-1.2		
	Indirect bilirubin	0.2-0.7		
	SGOT	0-40		
	SGPT	0-35		

	Alkaline phosphatase	**80-290**		
	ASO Titer			
	RA Factor			
	C-Reactive Protein			
LIPID PROFILE	**Serum total cholesterol**	**150-225mg/dl**		
	Serum triglycerides	**30-63mg/dl**		
	HDL Cholesterol	**<130mg/dl**		
	LDL Cholesterol	**<40mg/dl**		
	VLDL Cholesterol	**<160mg/dl**		

B. URINE ANALYSIS

URINE INVESTIGATION	BEFORE TMT(DATE)	AFTER TMT (DATE)
Albumin		
Fasting sugar		
PP sugar		
Deposits		

Date:

Station:

Signature of the Investigator:

Signature of the Lecturer: **Signature of the HOD**

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Name of Principal Investigator: Dr.T.R.Nishitha

FORM-VI – CONSENT FORM

"I have read the foregoing information, or it has been read to me. I have had the opportunity to ask questions about it and any questions I have asked have been answered to my satisfaction.

I consent voluntarily to participate as a participant in this study and understand that I have the right to withdraw from the study at any time without in any way it affecting my further medical care".

"I have received a copy of the information sheet/consent form".

Date:

Signature of the participant

In case of illiterate participant

"I have witnessed the accurate reading of the consent form to the potential participant, and the individual has had the opportunity to ask questions. I confirm individual has given consent freely."

Date:

Signature of a witness
(Selected by the participant bearing no connection with the survey team)

Left thumb Impression of the Participant

FORM –VI ஒப்புதல் படிவம்

ஆய்வாளரால் சான்றளிக்கப்பட்டது

நான் வளி அழல் கீல் வாயு என்னும் நோயின் ஆய்வைக் குறித்த அனைத்து விபரங்களையும் நோயாளிக்குப்புரியும் வகையில் எடுத்துரைத்தேன் என உறுதியளிக்கிறேன்.

தேதி: **கையொப்பம்:**

இடம்: **பெயர்:**

நோயாளியின் ஒப்புதல்

என்னிடம் இந்த மருத்துவ ஆய்வின் காரணத்தையும், மருந்தின் தன்மை மற்றும்மருத்துவ வழிமுறை பற்றியும், தொடர்ந்து எனது உடல் இயக்கத்தைக் கண்காணிக்கவும், அதனைப் பாதுகாக்கவும் பயன்படும்மருத்துவ ஆய்வுக்கூட பரிசோதனைகள் பற்றி திருப்தி அளிக்கும் வகையில் ஆய்வு மருத்துவரால் விளக்கிக் கூறப்பட்டது.

நான் இந்தமருத்துவ ஆய்வின் போது, எப்பொழுது வேண்டுமானாலும்இந்த ஆய்விலிருந்து என்னை விடுவித்து கொள்ளும் உரிமையைத் தெரிந்திருக்கின்றேன்.

நான் என்னுடைய சுதந்திரமாகத் தேர்வு செய்யும் உரிமையைக் கொண்டு வளிஅழல் கீல் வாயு நோய்க்கான வாத சூரணம்(உள் மருந்து) மற்றும் வாதமேகநாராயணஎண்ணெய்(வெளி மருந்து) மருந்தின் பரிகரிப்புத் திறனைக் கண்டறியும் மருத்துவ ஆய்விற்கு என்னை உட்படுத்த ஒப்புதல் அளிக்கிறேன்.

தேதி: **கையொப்பம்:**

இடம்: **பெயர்:**

சாட்சிக்காரர்கையொப்பம்:

பெயர்:

உறவுமுறை:

விரிவுரையாளார் கையொப்பம்:துறைத்தலைவர் கையொப்பம்:

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Name of Principal Investigator: Dr.T.R.Nishitha

FORM VII -WITHDRAWAL FORM

1. SERIAL NO OF THE CASE:

2. OP / IP NO:

3. NAME:

4. AGE:

5. GENDER:

6. DATE OF TRIAL COMMENCEMENT:

7. DATE OF WITHDRAWAL FROM TRIAL:

8. REASONS FOR WITHDRAWAL:

Long absence at reporting:	Yes/ No
Irregular treatment:	Yes/ No
Shift of locality:	Yes/No
Increase in severity of symptoms:	Yes/No
Development of severe adverse drug reactions:	Yes/No
Development of adverse event:	Yes/No

(If YES, give the details of adverse reaction in Form VII -B – Adverse Reaction Form / Pharmaco Vigilance Form)

Date:

Station:

Signature of the Investigator:

Signature of the Lecturer: **Signature of the HOD**

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Name of Principal Investigator: Dr.T.R.Nishitha

FORM VII - A – ADVERSE REACTION FORM / PHARMACO VIGILANCE FORM

SERIAL NO:

OP/IP NO:

NAME: **AGE:** **GENDER:**

DATE OF TRIAL COMMENCEMENT:

DATE OF THE ADVERSE REACTION OCCUR:

DESCRIPTION OF ADVERSE REACTION:

Date:

Station:

Signature of the Investigator:

Signature of the Lecturer: **Signature of the HOD**

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FORM V– PATIENT INFORMATION SHEET

Name of Principal Investigator: Dr.T.R.Nishitha

Name of the institute: National Institute of Siddha,
Tambaram Sanatorium,
Chennai-47.

INFORMATION SHEET FOR PATIENTS PARTICIPATING IN THE OPEN CLINICAL TRIAL.

I,**:**Dr.T.R.Nishitha , studying M.D(Siddha) at National Institute of Siddha, Tambaram Sanatorium is doing a trial on ***"VALI AHZAL KEEL VAYU"*** (Rheumatoid arthritis). It is a common degenerative disease, occurring throughout the world. In this regard, I am in a need to ask you few questions. I will maintain confidentiality of your comments and data obtained. There will be no risk of disclosing your identity and no physical, psychological or professional risk is involved by taking part in this study. Taking part in this study is voluntary. No compensation will be paid to you for taking part in this study.

You can choose not to take part. You can choose not to answer a specific question. There is no specific benefit for you if you take part in the study. However, taking part in the study may be of benefit to the community, as it may help us to understand the problem of defaulters and potential solutions.

If you agree to be a participant in this study, you will be included in the study primarily by signing the consent form and then you will be given the internal medicine***" VATHA CHOORANAM"***(Internal medicine) 2gm, twice a day, for 48 days and ***"VATHA MEGA NARAYANA ENNAI***(External medicine). If you wish to stay in the In Patient ward Treatment will be provided to you assuring that you will not be definitely hurt in any course of treatment.

The information I am collecting in this study will remain between you and the principal investigator (myself). I will ask you few questions through a questionnaire. I will not write your name on this form. Ur name won't be mentioned in the lab investigation form instead a code will be used.

The questionnaire will take approximately 20 minutes of your time.

If you want to know more about this study before taking part, you can ask me all the questions you want or contact Dr.T.R.Nishitha, PG Scholar cum principal investigator of this study, National Institute of Siddha, Chennai-47. You can also contact the Member-secretary of Ethics committee, National Institute Siddha, Chennai 600047, Tel.No: 91-44-22380789, for rights and participation in the study.

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AYOTHIDOSS PANDITHAR HOSPITAL, CHENNAI – 600 047.

DEPARTMENT OF SIRAPPU MARUTHUVAM

PRECLINICAL AND CLINICAL STUDY OF SIDDHA DRUG*S* *"VAATHA CHOORANAM"* (INTERNAL) AND "*VATHA MEGA NARAYANA ENNAI"* (EXTERNAL) IN THE TREATMENT OF *"VALI AZHAL KEEL VAYU"* (*RHEUMATOID ARTHRITIS*)

Principal Investigator: Dr.T.R.Nishitha

சேர்க்க கூடிய உணவுகள்:

காய்கள்:

முருங்கைபிஞ்சு,

அவரைபிஞ்சு,

பிரண்டை,

காரட்,

பீட்ரூட்.

கீரைகள்:

கரிசாலை,

பொன்னாங்கண்ணி,

மணத்தக்காளி,

முருங்கைகீரை,

பசலைகீரை,

சிறுகீரை,

கறிவேப்பிலை,

கொத்தமல்லி.

புதினா.

பழங்கள்:

மாதுளை,

ஆப்பிள்,

வாழை,

பேரீச்சை,

அத்தி,

திராட்சை,

கொய்யா

நாவல்,

சப்போட்டா,

உலர் திராட்சை.

தானியங்கள்

முளை கட்டிய பயிர் வகைகள்,

சோயாபீன்ஸ்,

வெந்தயம்.

அசைவம்:

வெள்ளாட்டுகறி ஈரல்,

எலும்புமஜ்ஜை,

மற்றவை:

பனை வெல்லம்

பால்

தவிர்க்க வேண்டியவைகள்:

கோழிக்கறி, மீன், நண்டு, கருவாடு,

வேர்க்கடலை,

எள்ளு,

பப்பாளி,

அன்னாசி,

நல்லெண்ணெய்,

புளிப்பு பொருள்கள்,

எலுமிச்சை,

தக்காளி,

புளிப்பு தயிர் மோர்,

ஊறுகாய்,

பெண்போகம்,புகையிலை ,

வெற்றிலை,பாக்கு ,

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Source: National Institute of Siddha
Purpose: Academic Research
Date: 22/05/2017

Sample ID C2MMT Code:

RBC (×10⁶ µl)	5.2
WBC (×10 ³ µl)	9.7
PLT (×10 ³ µl)	732
HGB (g/dl)	12.5
MCH (pg)	15.5
MCV(fl)	59.1
Neutrophils 10³/mm3	1.9
Eosinophils (%)	1.7
Basophils (%)	0
Lymph (%)	87.3
Mon (%)	5.8

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Sample ID C1HMT Code:

RBC (×10⁶ µl)	4.1
WBC (×10 ³ µl)	13.4
PLT (×10 ³ µl)	621
HGB (g/dl)	14.4
MCH (pg)	20.6
MCV(fl)	64.6
Neutrophils 10³/mm3	1.8
Eosinophils (%)	1.9
Basophils (%)	0
Lymph (%)	78.3
Mon (%)	4.8

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Sample ID C1HMH Code:

RBC (×10⁶ µl)	5.2
WBC (×10 ³ µl)	11.3
PLT (×10 ³ µl)	538
HGB (g/dl)	14.8
MCH (pg)	21
MCV(fl)	60.4
Neutrophils 10³/mm3	2.5
Eosinophils (%)	1.2
Basophils (%)	0
Lymph (%)	87.4
Mon (%)	3.2

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Sample ID C2LFH Code:

RBC (×10⁶ µl)	5.8
WBC (×10 ³ µl)	12.2
PLT (×10 ³ µl)	519
HGB (g/dl)	15.7
MCH (pg)	21.3
MCV(fl)	66.8
Neutrophils 10³/mm3	3.1
Eosinophils (%)	1.1
Basophils (%)	0
Lymph (%)	67.3
Mon (%)	3.3

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Sample ID C1HMB Code:

RBC (×10⁶ µl)	4.7
WBC (×10 ³ µl)	7.3
PLT (×10 ³ µl)	656
HGB (g/dl)	15.5
MCH (pg)	22.2
MCV(fl)	62.9
Neutrophils 10³/mm3	3.1
Eosinophils (%)	1.4
Basophils (%)	0
Lymph (%)	66.2
Mon (%)	4.4

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Sample ID C2LFT Code:

RBC (×10⁶ µl)	4.6
WBC (×10 ³ µl)	8.3
PLT (×10 ³ µl)	745
HGB (g/dl)	13.9
MCH (pg)	20.5
MCV(fl)	58
Neutrophils 10³/mm3	3.2
Eosinophils (%)	1.3
Basophils (%)	0
Lymph (%)	67.6
Mon (%)	2.3

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Sample ID C2HFT Code:

RBC (×10⁶ µl)	2.9
WBC (×10 ³ µl)	9.4
PLT (×10 ³ µl)	863
HGB (g/dl)	12.5
MCH (pg)	16.4
MCV(fl)	72.4
Neutrophils 10³/mm3	4
Eosinophils (%)	1.5
Basophils (%)	0
Lymph (%)	75.5
Mon (%)	3.1

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Sample ID C2MFH Code:

RBC (×10⁶ µl)	8.8
WBC (×10 ³ µl)	9.9
PLT (×10 ³ µl)	774
HGB (g/dl)	12.2
MCH (pg)	17.9
MCV(fl)	58.8
Neutrophils 10³/mm3	2.4
Eosinophils (%)	1.6
Basophils (%)	1
Lymph (%)	89.8
Mon (%)	1.6

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Sample ID C2MFB Code:

RBC (×10⁶ µl)	7.7
WBC (×10 ³ µl)	7.1
PLT (×10 ³ µl)	753
HGB (g/dl)	14.3
MCH (pg)	14.9
MCV(fl)	74
Neutrophils 10³/mm3	1.6
Eosinophils (%)	1.5
Basophils (%)	0
Lymph (%)	71.9
Mon (%)	3.4

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Sample ID C1HMH Code:

RBC (×10⁶ µl)	6.4
WBC (×10 ³ µl)	6.7
PLT (×10 ³ µl)	882
HGB (g/dl)	8.5
MCH (pg)	13.4
MCV(fl)	55.5
Neutrophils 10³/mm3	1.7
Eosinophils (%)	1.4
Basophils (%)	0
Lymph (%)	82.5
Mon (%)	1.3

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Sample ID C2MFT Code:

RBC (×10⁶ µl)	5.3
WBC (×10 ³ µl)	8
PLT (×10 ³ µl)	781
HGB (g/dl)	12.6
MCH (pg)	21.1
MCV(fl)	70.6
Neutrophils 10³/mm3	2.6
Eosinophils (%)	1.3
Basophils (%)	0
Lymph (%)	73.3
Mon (%)	1.3

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Sample ID C2HMB Code:

RBC (×10⁶ µl)	6.5
WBC (×10 ³ µl)	9.5
PLT (×10 ³ µl)	678
HGB (g/dl)	14.6
MCH (pg)	26.3
MCV(fl)	60.4
Neutrophils 10³/mm3	3.1
Eosinophils (%)	1.5
Basophils (%)	1
Lymph (%)	61.7
Mon (%)	2.3

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Sample ID C1HFB Code:

RBC (×10⁶ µl)	5.9
WBC (×10 ³ µl)	7.3
PLT (×10 ³ µl)	955
HGB (g/dl)	9.6
MCH (pg)	17.2
MCV(fl)	65.3
Neutrophils 10³/mm3	2.2
Eosinophils (%)	1.3
Basophils (%)	0
Lymph (%)	78.7
Mon (%)	1.7

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Sample ID C1MFT Code:

RBC (×10⁶ µl)	5.4
WBC (×10 ³ µl)	15.2
PLT (×10 ³ µl)	946
HGB (g/dl)	14.9
MCH (pg)	17.1
MCV(fl)	66.2
Neutrophils 10³/mm3	1.9
Eosinophils (%)	1.7
Basophils (%)	0
Lymph (%)	89.8
Mon (%)	5.8

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Sample ID C1LMH Code:

RBC (×10⁶ µl)	5.5
WBC (×10 ³ µl)	7.3
PLT (×10 ³ µl)	862
HGB (g/dl)	12.5
MCH (pg)	21.6
MCV(fl)	52.1
Neutrophils 10³/mm3	1.8
Eosinophils (%)	1.1
Basophils (%)	1
Lymph (%)	61.8
Mon (%)	5.3

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Date: 22/05/2017

Sample ID C1LFH Code:

RBC (×10⁶ µl)	5.4
WBC (×10 ³ µl)	13.6
PLT (×10 ³ µl)	655
HGB (g/dl)	12.1
MCH (pg)	22.2
MCV(fl)	60.3
Neutrophils 10³/mm3	3.3
Eosinophils (%)	1.5
Basophils (%)	0
Lymph (%)	68.9
Mon (%)	3.6

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Sample ID C2MMH Code:

RBC (×10⁶ µl)	6.4
WBC (×10 ³ µl)	9.4
PLT (×10 ³ µl)	885
HGB (g/dl)	15.2
MCH (pg)	23.6
MCV(fl)	52.8
Neutrophils 10³/mm3	2.9
Eosinophils (%)	1.5
Basophils (%)	0
Lymph (%)	62.4
Mon (%)	4.7

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Sample ID C2MMB Code:

RBC (×10⁶ µl)	5.3
WBC (×10 ³ µl)	7.5
PLT (×10 ³ µl)	692
HGB (g/dl)	14.5
MCH (pg)	20.3
MCV(fl)	50.4
Neutrophils 10³/mm3	2.7
Eosinophils (%)	1.7
Basophils (%)	0
Lymph (%)	60.5
Mon (%)	3.3

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Sample ID C2HFB Code:

RBC (×10⁶ µl)	6.2
WBC (×10 ³ µl)	10.2
PLT (×10 ³ µl)	525
HGB (g/dl)	16.3
MCH (pg)	20.7
MCV(fl)	65
Neutrophils 10³/mm3	2.9
Eosinophils (%)	1.9
Basophils (%)	0
Lymph (%)	96.9
Mon (%)	2.3

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Sample ID C2LMH Code:

RBC (×10⁶ µl)	6.2
WBC (×10 ³ µl)	10.3
PLT (×10 ³ µl)	738
HGB (g/dl)	14.7
MCH (pg)	23.4
MCV(fl)	55.2
Neutrophils 10³/mm3	2.2
Eosinophils (%)	1.9
Basophils (%)	1
Lymph (%)	85.3
Mon (%)	4.2

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Sample ID C2HMT Code:

RBC (×10⁶ µl)	7.1
WBC (×10 ³ µl)	8.5
PLT (×10 ³ µl)	836
HGB (g/dl)	12.4
MCH (pg)	18.8
MCV(fl)	50.7
Neutrophils 10³/mm3	1.7
Eosinophils (%)	1.4
Basophils (%)	0
Lymph (%)	73.2
Mon (%)	3.1

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Sample ID C2LMT Code:

RBC (×10⁶ µl)	6.2
WBC (×10 ³ µl)	12.2
PLT (×10 ³ µl)	943
HGB (g/dl)	15.5
MCH (pg)	16.9
MCV(fl)	52.8
Neutrophils 10³/mm3	3.2
Eosinophils (%)	1.3
Basophils (%)	0
Lymph (%)	86.2
Mon (%)	4.1

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Sample ID C1LFH Code:

RBC (×10⁶ µl)	7.6
WBC (×10 ³ µl)	9.5
PLT (×10 ³ µl)	856
HGB (g/dl)	9.5
MCH (pg)	19.9
MCV(fl)	51.2
Neutrophils 10³/mm3	2.7
Eosinophils (%)	1.2
Basophils (%)	1
Lymph (%)	86.3
Mon (%)	5.4

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Sample ID C1LMT Code:

RBC (×10⁶ µl)	7.7
WBC (×10 ³ µl)	8.4
PLT (×10 ³ µl)	926
HGB (g/dl)	14.1
MCH (pg)	19.1
MCV(fl)	67.7
Neutrophils 10³/mm3	1.1
Eosinophils (%)	1.1
Basophils (%)	0
Lymph (%)	67.1
Mon (%)	5.5

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Sample ID C1MMB Code:

RBC (×10⁶ µl)	7.9
WBC (×10 ³ µl)	8.1
PLT (×10 ³ µl)	623
HGB (g/dl)	11.8
MCH (pg)	20.8
MCV(fl)	68.1
Neutrophils 10³/mm3	1.2
Eosinophils (%)	1.1
Basophils (%)	0
Lymph (%)	75.1
Mon (%)	4.4

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Sample ID C2HFH Code:

RBC (×10⁶ µl)	5.4
WBC (×10 ³ µl)	8.4
PLT (×10 ³ µl)	732
HGB (g/dl)	9.7
MCH (pg)	20.6
MCV(fl)	63.2
Neutrophils 10³/mm3	3.1
Eosinophils (%)	1.2
Basophils (%)	0
Lymph (%)	84.2
Mon (%)	3.5

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Sample ID C1LFB Code:

RBC (×10⁶ µl)	5.3
WBC (×10 ³ µl)	12.1
PLT (×10 ³ µl)	512
HGB (g/dl)	15.4
MCH (pg)	17.2
MCV(fl)	72.5
Neutrophils 10³/mm3	2.7
Eosinophils (%)	1.9
Basophils (%)	1
Lymph (%)	63.3
Mon (%)	4.2

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Sample ID C1LMB Code:

RBC (×10⁶ µl)	6.2
WBC (×10 ³ µl)	15.2
PLT (×10 ³ µl)	631
HGB (g/dl)	13.5
MCH (pg)	18.7
MCV(fl)	67.9
Neutrophils 10³/mm3	2.8
Eosinophils (%)	1.8
Basophils (%)	0
Lymph (%)	64.4
Mon (%)	2.8

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Sample ID C1HFH Code:

RBC (×10⁶ µl)	5.5
WBC (×10 ³ µl)	11.1
PLT (×10 ³ µl)	772
HGB (g/dl)	12.4
MCH (pg)	21.7
MCV(fl)	52.6
Neutrophils 10³/mm3	2.9
Eosinophils (%)	1.7
Basophils (%)	0
Lymph (%)	78.7
Mon (%)	5.6

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Sample ID C2HMH Code:

RBC (×10⁶ µl)	7.4
WBC (×10 ³ µl)	15.5
PLT (×10 ³ µl)	848
HGB (g/dl)	14.1
MCH (pg)	17.9
MCV(fl)	68.3
Neutrophils 10³/mm3	2.7
Eosinophils (%)	1.5
Basophils (%)	0
Lymph (%)	86.9
Mon (%)	5.5

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Sample ID C1HFT Code:

RBC (×10⁶ µl)	6.3
WBC (×10 ³ µl)	10.4
PLT (×10 ³ µl)	932
HGB (g/dl)	9
MCH (pg)	19.2
MCV(fl)	54.5
Neutrophils 10³/mm3	2.5
Eosinophils (%)	1.4
Basophils (%)	1
Lymph (%)	97.9
Mon (%)	3.3

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Sample ID C1LFT Code:

RBC (×10⁶ µl)	5.2
WBC (×10 ³ µl)	8.7
PLT (×10 ³ µl)	748
HGB (g/dl)	14
MCH (pg)	21.3
MCV(fl)	52.5
Neutrophils 10³/mm3	1.7
Eosinophils (%)	1.3
Basophils (%)	0
Lymph (%)	88.2
Mon (%)	2.4

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Date: 22/05/2017

Sample ID C1MFH Code:

RBC (×10⁶ µl)	6.8
WBC (×10 ³ µl)	8.7
PLT (×10 ³ µl)	622
HGB (g/dl)	14.9
MCH (pg)	17.3
MCV(fl)	68.3
Neutrophils 10³/mm3	1.5
Eosinophils (%)	1.8
Basophils (%)	1
Lymph (%)	82.2
Mon (%)	3.5

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Sample ID C2LMB Code:

RBC (×10⁶ µl)	5.6
WBC (×10 ³ µl)	13.6
PLT (×10 ³ µl)	728
HGB (g/dl)	16.6
MCH (pg)	19.2
MCV(fl)	63.2
Neutrophils 10³/mm3	1.6
Eosinophils (%)	1.4
Basophils (%)	0
Lymph (%)	81.7
Mon (%)	2.4

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Sample ID C2HFB Code:

BUN (mg/dl)	12.2
Serum Creatinine (mg/dl)	1
Total Bilirubin (mg/dl)	0.2
SGOT (IU/ml)	132
SGPT (IU/ml)	41
Total cholesterol (mg/dl)	134.9
HDL (mg/dl)	55
LDL (mg/dl)	52
VLDL (mg/dl)	27.9
TG (mg/dl)	21

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Sample ID C1MMT Code:

BUN (mg/dl)	20
Serum Creatinine (mg/dl)	0.7
Total Bilirubin (mg/dl)	0.4
SGOT (IU/ml)	120
SGPT (IU/ml)	29
Total cholesterol (mg/dl)	119.8
HDL (mg/dl)	63
LDL (mg/dl)	38
VLDL (mg/dl)	18.8
TG (mg/dl)	28

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Sample ID C2MMB Code:

BUN (mg/dl)	14.5
Serum Creatinine (mg/dl)	0.7
Total Bilirubin (mg/dl)	0.5
SGOT (IU/ml)	147
SGPT (IU/ml)	42
Total cholesterol (mg/dl)	142.7
HDL (mg/dl)	74
LDL (mg/dl)	43
VLDL (mg/dl)	25.7
TG (mg/dl)	31

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Sample ID C1LMT Code:

BUN (mg/dl)	15.3
Serum Creatinine (mg/dl)	0.8
Total Bilirubin (mg/dl)	0.3
SGOT (IU/ml)	178
SGPT (IU/ml)	28
Total cholesterol (mg/dl)	110.2
HDL (mg/dl)	55
LDL (mg/dl)	45
VLDL (mg/dl)	10.2
TG (mg/dl)	14

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Sample ID C2HFT Code:

BUN (mg/dl)	16.5
Serum Creatinine (mg/dl)	0.6
Total Bilirubin (mg/dl)	0.5
SGOT (IU/ml)	197
SGPT (IU/ml)	56
Total cholesterol (mg/dl)	123.3
HDL (mg/dl)	57
LDL (mg/dl)	41
VLDL (mg/dl)	25.3
TG (mg/dl)	49

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Sample ID C2LMB Code:

BUN (mg/dl)	19.5
Serum Creatinine (mg/dl)	1.1
Total Bilirubin (mg/dl)	0.5
SGOT (IU/ml)	156
SGPT (IU/ml)	64
Total cholesterol (mg/dl)	149.1
HDL (mg/dl)	74
LDL (mg/dl)	54
VLDL (mg/dl)	21.1
TG (mg/dl)	53

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Sample ID C1MMH Code:

BUN (mg/dl)	15.2
Serum Creatinine (mg/dl)	1.1
Total Bilirubin (mg/dl)	0.2
SGOT (IU/ml)	123
SGPT (IU/ml)	24
Total cholesterol (mg/dl)	179.3
HDL (mg/dl)	73
LDL (mg/dl)	82
VLDL (mg/dl)	24.3
TG (mg/dl)	68

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Sample ID C2HFH Code:

BUN (mg/dl)	18.4
Serum Creatinine (mg/dl)	0.7
Total Bilirubin (mg/dl)	0.4
SGOT (IU/ml)	94
SGPT (IU/ml)	42
Total cholesterol (mg/dl)	165.2
HDL (mg/dl)	67
LDL (mg/dl)	82
VLDL (mg/dl)	16.2
TG (mg/dl)	53

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Sample ID C2HMB Code:

BUN (mg/dl)	16.3
Serum Creatinine (mg/dl)	0.8
Total Bilirubin (mg/dl)	0.3
SGOT (IU/ml)	118
SGPT (IU/ml)	34
Total cholesterol (mg/dl)	174.1
HDL (mg/dl)	86
LDL (mg/dl)	73
VLDL (mg/dl)	15.1
TG (mg/dl)	49

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Sample ID C1LMB Code:

BUN (mg/dl)	16.5
Serum Creatinine (mg/dl)	0.9
Total Bilirubin (mg/dl)	0.5
SGOT (IU/ml)	186
SGPT (IU/ml)	54
Total cholesterol (mg/dl)	150.2
HDL (mg/dl)	78
LDL (mg/dl)	61
VLDL (mg/dl)	11.2
TG (mg/dl)	34

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Sample ID C1LMH Code:

BUN (mg/dl)	20.1
Serum Creatinine (mg/dl)	0.8
Total Bilirubin (mg/dl)	0.5
SGOT (IU/ml)	125
SGPT (IU/ml)	55
Total cholesterol (mg/dl)	153.1
HDL (mg/dl)	64
LDL (mg/dl)	64
VLDL (mg/dl)	25.1
TG (mg/dl)	61

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Sample ID C1LFT Code:

BUN (mg/dl)	17.4
Serum Creatinine (mg/dl)	0.7
Total Bilirubin (mg/dl)	0.4
SGOT (IU/ml)	199
SGPT (IU/ml)	73
Total cholesterol (mg/dl)	169.4
HDL (mg/dl)	73
LDL (mg/dl)	76
VLDL (mg/dl)	20.4
TG (mg/dl)	74

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Sample ID C1HMT Code:

BUN (mg/dl)	20
Serum Creatinine (mg/dl)	0.6
Total Bilirubin (mg/dl)	0.5
SGOT (IU/ml)	154
SGPT (IU/ml)	21
Total cholesterol (mg/dl)	133.5
HDL (mg/dl)	62
LDL (mg/dl)	58
VLDL (mg/dl)	13.5
TG (mg/dl)	47

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Sample ID C1MMB Code:

BUN (mg/dl)	15.5
Serum Creatinine (mg/dl)	1.2
Total Bilirubin (mg/dl)	0.5
SGOT (IU/ml)	90
SGPT (IU/ml)	31
Total cholesterol (mg/dl)	161.6
HDL (mg/dl)	72
LDL (mg/dl)	60
VLDL (mg/dl)	29.6
TG (mg/dl)	54

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Sample ID C1HFB Code:

BUN (mg/dl)	13.9
Serum Creatinine (mg/dl)	0.9
Total Bilirubin (mg/dl)	0.9
SGOT (IU/ml)	132
SGPT (IU/ml)	40
Total cholesterol (mg/dl)	161.8
HDL (mg/dl)	68
LDL (mg/dl)	70
VLDL (mg/dl)	23.8
TG (mg/dl)	45

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Sample ID C1HFT Code:

BUN (mg/dl)	20
Serum Creatinine (mg/dl)	0.6
Total Bilirubin (mg/dl)	0.2
SGOT (IU/ml)	140
SGPT (IU/ml)	27
Total cholesterol (mg/dl)	176.8
HDL (mg/dl)	67
LDL (mg/dl)	85
VLDL (mg/dl)	24.8
TG (mg/dl)	56

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Sample ID C1HMH Code:

BUN (mg/dl)	13.4
Serum Creatinine (mg/dl)	0.7
Total Bilirubin (mg/dl)	0.4
SGOT (IU/ml)	211
SGPT (IU/ml)	86
Total cholesterol (mg/dl)	157.4
HDL (mg/dl)	75
LDL (mg/dl)	64
VLDL (mg/dl)	18.4
TG (mg/dl)	52

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Sample ID C1HMB Code:

BUN (mg/dl)	16.1
Serum Creatinine (mg/dl)	0.5
Total Bilirubin (mg/dl)	0.8
SGOT (IU/ml)	121
SGPT (IU/ml)	53
Total cholesterol (mg/dl)	124.1
HDL (mg/dl)	66
LDL (mg/dl)	43
VLDL (mg/dl)	15.1
TG (mg/dl)	43

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Date: 22/05/2017

Sample ID C2MMT Code:

BUN (mg/dl)	18.4
Serum Creatinine (mg/dl)	1.1
Total Bilirubin (mg/dl)	0.4
SGOT (IU/ml)	90
SGPT (IU/ml)	28
Total cholesterol (mg/dl)	130.3
HDL (mg/dl)	62
LDL (mg/dl)	52
VLDL (mg/dl)	16.3
TG (mg/dl)	58

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Sample ID C2MMH Code:

BUN (mg/dl)	12.6
Serum Creatinine (mg/dl)	0.8
Total Bilirubin (mg/dl)	0.6
SGOT (IU/ml)	83
SGPT (IU/ml)	32
Total cholesterol (mg/dl)	121.5
HDL (mg/dl)	64
LDL (mg/dl)	46
VLDL (mg/dl)	11.5
TG (mg/dl)	54

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Sample ID C2LMT Code:

BUN (mg/dl)	17.2
Serum Creatinine (mg/dl)	1
Total Bilirubin (mg/dl)	0.2
SGOT (IU/ml)	130
SGPT (IU/ml)	25
Total cholesterol (mg/dl)	160.2
HDL (mg/dl)	65
LDL (mg/dl)	74
VLDL (mg/dl)	21.2
TG (mg/dl)	22

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Sample ID C1LFH Code:

BUN (mg/dl)	18.3
Serum Creatinine (mg/dl)	0.5
Total Bilirubin (mg/dl)	0.3
SGOT (IU/ml)	128
SGPT (IU/ml)	45
Total cholesterol (mg/dl)	173.1
HDL (mg/dl)	55
LDL (mg/dl)	83
VLDL (mg/dl)	35.1
TG (mg/dl)	33

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Date: 22/05/2017

Sample ID C2HMH Code:

BUN (mg/dl)	20.1
Serum Creatinine (mg/dl)	1
Total Bilirubin (mg/dl)	0.1
SGOT (IU/ml)	155
SGPT (IU/ml)	71
Total cholesterol (mg/dl)	172.7
HDL (mg/dl)	51
LDL (mg/dl)	97
VLDL (mg/dl)	24.7
TG (mg/dl)	28

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Sample ID C2HMT Code:

BUN (mg/dl)	12.3
Serum Creatinine (mg/dl)	0.6
Total Bilirubin (mg/dl)	0.3
SGOT (IU/ml)	118
SGPT (IU/ml)	40
Total cholesterol (mg/dl)	140.8
HDL (mg/dl)	64
LDL (mg/dl)	66
VLDL (mg/dl)	10.8
TG (mg/dl)	37

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Sample ID C2LFH Code:

BUN (mg/dl)	13.6
Serum Creatinine (mg/dl)	0.7
Total Bilirubin (mg/dl)	0.6
SGOT (IU/ml)	82
SGPT (IU/ml)	29
Total cholesterol (mg/dl)	122.1
HDL (mg/dl)	56
LDL (mg/dl)	52
VLDL (mg/dl)	14.1
TG (mg/dl)	32

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Sample ID C2LMH Code:

BUN (mg/dl)	10.2
Serum Creatinine (mg/dl)	0.8
Total Bilirubin (mg/dl)	0.2
SGOT (IU/ml)	70
SGPT (IU/ml)	23
Total cholesterol (mg/dl)	169.1
HDL (mg/dl)	59
LDL (mg/dl)	79
VLDL (mg/dl)	31.1
TG (mg/dl)	46

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Sample ID C1HFH Code:

BUN (mg/dl)	15.2
Serum Creatinine (mg/dl)	0.6
Total Bilirubin (mg/dl)	0.2
SGOT (IU/ml)	80
SGPT (IU/ml)	63
Total cholesterol (mg/dl)	175.1
HDL (mg/dl)	55
LDL (mg/dl)	98
VLDL (mg/dl)	22.1
TG (mg/dl)	55

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Sample ID C1MFT Code:

BUN (mg/dl)	12.3
Serum Creatinine (mg/dl)	0.7
Total Bilirubin (mg/dl)	0.3
SGOT (IU/ml)	161
SGPT (IU/ml)	64
Total cholesterol (mg/dl)	144.8
HDL (mg/dl)	71
LDL (mg/dl)	62
VLDL (mg/dl)	11.8
TG (mg/dl)	44

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Sample ID C1MFB Code:

BUN (mg/dl)	13.4
Serum Creatinine (mg/dl)	1
Total Bilirubin (mg/dl)	0.4
SGOT (IU/ml)	88
SGPT (IU/ml)	29
Total cholesterol (mg/dl)	140
HDL (mg/dl)	62
LDL (mg/dl)	52
VLDL (mg/dl)	26
TG (mg/dl)	29

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Sample ID C2MFH Code:

BUN (mg/dl)	12.3
Serum Creatinine (mg/dl)	0.8
Total Bilirubin (mg/dl)	0.3
SGOT (IU/ml)	95
SGPT (IU/ml)	30
Total cholesterol (mg/dl)	136.4
HDL (mg/dl)	52
LDL (mg/dl)	64
VLDL (mg/dl)	20.4
TG (mg/dl)	33

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Source: National Institute of Siddha
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Date: 22/05/2017

Sample ID C2LFB Code:

BUN (mg/dl)	13.2
Serum Creatinine (mg/dl)	1
Total Bilirubin (mg/dl)	0.2
SGOT (IU/ml)	158
SGPT (IU/ml)	55
Total cholesterol (mg/dl)	150.6
HDL (mg/dl)	51
LDL (mg/dl)	73
VLDL (mg/dl)	26.6
TG (mg/dl)	56

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Sample ID C1MFH Code:

BUN (mg/dl)	16.3
Serum Creatinine (mg/dl)	0.7
Total Bilirubin (mg/dl)	0.3
SGOT (IU/ml)	112
SGPT (IU/ml)	38
Total cholesterol (mg/dl)	146.1
HDL (mg/dl)	54
LDL (mg/dl)	77
VLDL (mg/dl)	15.1
TG (mg/dl)	57

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Sample ID C2MFB Code:

BUN (mg/dl)	20.2
Serum Creatinine (mg/dl)	0.8
Total Bilirubin (mg/dl)	0.2
SGOT (IU/ml)	126
SGPT (IU/ml)	47
Total cholesterol (mg/dl)	148
HDL (mg/dl)	54
LDL (mg/dl)	57
VLDL (mg/dl)	37
TG (mg/dl)	38

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